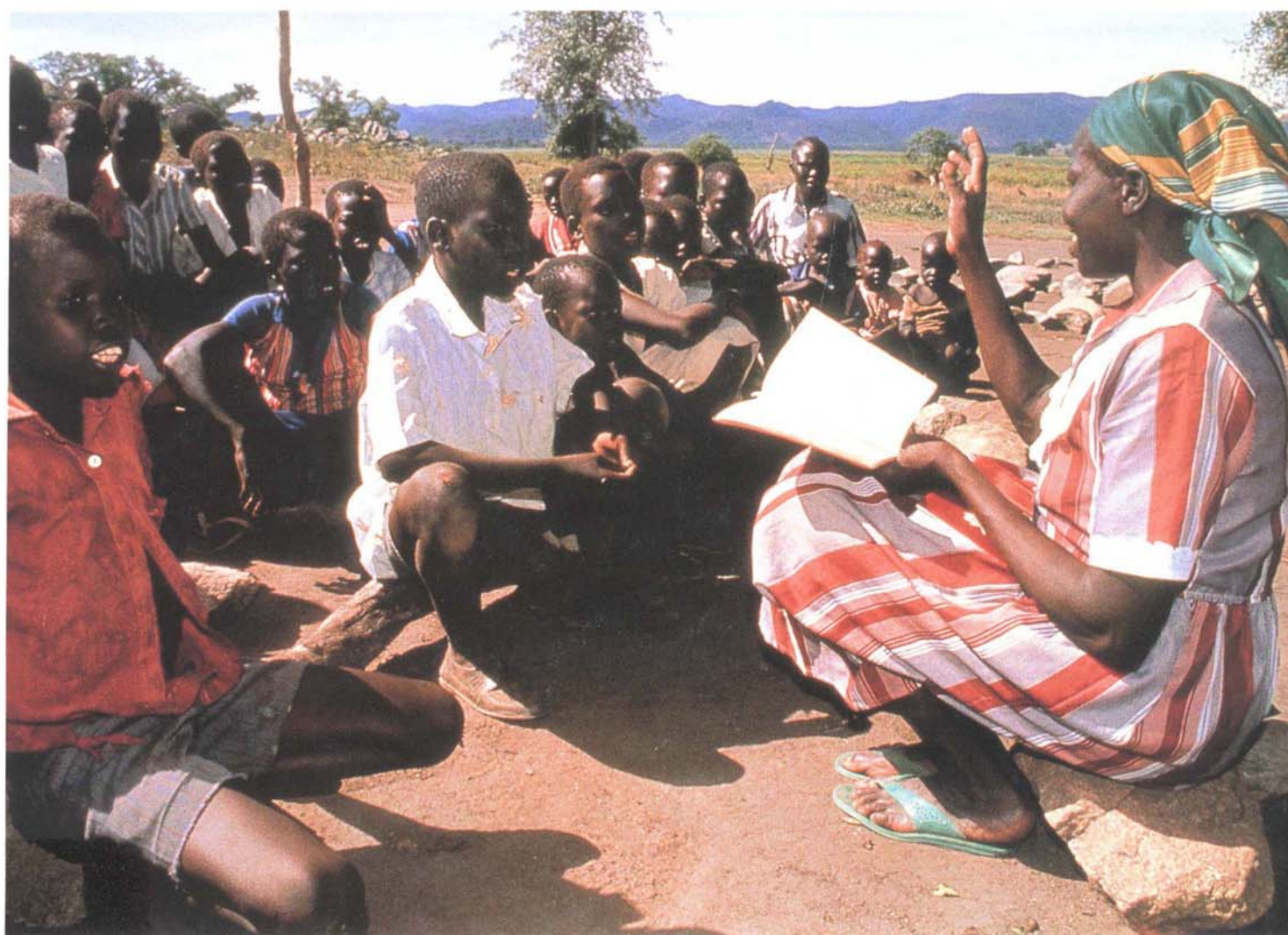


Udo Bude & Keith Lewin (eds.)

Improving Test Design

**Vol. 2 – Assessment of Science and Agriculture in Primary Schools
in Africa; 12 Country Cases Reviewed**



Cover photo: Gérard Klijn/present

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**Vol. 2 - Assessment of Science and Agriculture in Primary Schools in Africa;
12 Country Cases Reviewed**

- **Country Reports**
- **Examination Papers**
- **Follow-up Communications**

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1. Introduction

Udo Bude & Keith Lewin

As a follow-up to the World Conference on Education for All in 1990 several countries in southern and eastern Africa started analysing and revising their examination systems with the ultimate aim of improving the quality of teaching/learning. Examinations in countries of the region are a well established feature of the educational systems reaching back to colonial days. The achievements of pupils during the primary school cycle are in most cases tested in end-of-cycle examinations, whereby the performance of a pupil is tested in comparison with other pupils sitting the examination (norm-referenced tests). Such assessment procedures do not provide the full picture and fail to deliver sufficient information about the success of an education system in imparting those skills and competencies as laid down in the curricula.¹ In order to find out how proficient a pupil is in a particular subject, concept or skill without referring to other norm groups of pupils a different approach is required. This may have several elements which include greater use of school based assessment, evaluation of project work and techniques of continuous assessment. It may also seek to define competencies in terms of criterion statements against which performance can be judged. Criterion-referenced assessment is attractive since it sets standards that do not depend on the performance of other pupils and should provide reliable data on what has been achieved during the primary school years. Some countries in the region e.g. Botswana and Swaziland are already experimenting with this kind of approach to assessment.

¹ See Kellaghan, Th. & Greaney, V. (1992) Using Examinations to Improve Education. A Study in Fourteen African Countries. World Bank Technical Paper No. 165. The World Bank, Washington D.C.

Applying more comprehensive concepts of assessment is a significant step towards the improvement of the quality of teaching and learning. National examination systems are mostly designed to judge the individual pupil's achievements for selection purposes and to deliver comparative information about the performance of individual schools and regions. They are often an unreliable guide to actual levels of achievement.

Three aspects have to be taken into consideration when constructing most forms of assessment instruments:

- (1) the validity of assessment instruments (do they measure what they claim to be measuring? do they predict future performance adequately if they are to be used for selection?);
- (2) their reliability (do they work a consistent measure of performance which could be repeated with similar results? are measurement errors reduced to acceptable levels?);
- (3) their technical efficiency (is the system secure, cost-effective, or as appropriate time scale, free of bias towards or against different groups of candidates?).

For most pupils in the region primary education ends after seven to eight years with a national examination. The more selective such examinations are the greater is the attention and importance given by society, because the results of such annual exercises determine significantly the future of many children and the hopes and ambitions of many parents for their offspring.² The outcome of the examinations also have severe repercussions on the schools on learning and teaching methods, and on the teachers' role in local communities and within the education system (see box: »Vihiga plan« is the way out/Fortunes change for Kikuyu).

² See Dore, R. P. (1976) The Diploma Disease. Unwin Education. London.

EAST AFRICAN
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COMMENT

'Vihiga plan' is the way out

PARENTS in Sabatia Division of Vihiga District have embarked on an ambitious programme to improve education standards in the area.

Part of the master-plan lies in setting up an in-service training centre for secondary and primary school teachers and their deputies. Those who attended the leaders' meeting on how to improve education in the area made proposals of providing lunch to all examination classes in future.

However, whereas there is no so much novelty in advocating for managerial skills for headteachers, or even starting schools' feeding programme, it is important that parents are ready to initiate the scheme on a harambee basis.

Going by the results of the last year's Kenya Certificate of Primary Education (KCPE), one can just understand the urgency of having efforts to improve education in Vihiga. Out of 56 districts and municipalities, Vihiga was number 41.

By all standards, those results were not rosy, but perhaps the most important aspect is that parents are prepared to reverse the situation.

But even then, they are throwing a big challenge to the Ministry of Education and the Teachers Service Commission (TSC) whose responsibility is train and appoint of headteachers.

In the past, appointment of headteachers in both primary and secondary schools has been done in total disregard of experience and competence of headteachers and their deputies. Poor supervision of schools added to the problem.

As the leaders' meeting at Vokoli Girls Secondary School noted, there is paucity in supervision of headteachers, who more often become their own masters and oppressors of parents and other people who refuse to toe the line, or who question their decisions.

It is also important for the Ministry of Education to acknowledge community based programmes, and support them.

Fortunes change for Kikuyu

By STEPHEN MUMBI

The performance of the Kenya Certificate of Education has greatly improved in Kikuyu Division, according to the Zonal education officer, Alex Kibumwa.

He said the division which used to come last out of seven in the district was now number three.

Kikuyu came third after Lari and Githunguri in last year's KCPE results.

Addressing a prize-giving ceremony at Kikuyu Township Primary School recently, the officer teachers, pupils and parents to work harder to get better results.

The remarking of Mwan Gitau Primary School KCPE papers elevated it up from 110th to fourth position with a mean score of 429 marks in the district's 209 schools.

The Zonal Inspector of Schools, Mr James Wamwari and the Teachers Advisory Centre (TAC) tutor, Mrs Magdalene Kiambuthi, praised teachers for their work which had enabled Muguga to produce six of the top 10 schools and also six of the top 10 pupils in the district.

Kabete produced the best candidate in Samuel Muryua from Mahini Primary School.

Daily Nation
4/3/95

Tuesday, February 28, 1995

Despite the great attention paid to matters of testing and examining at the end of primary education, the examination results rarely provide sufficient information on the effectiveness of the educational system to make confident judgements on educational quality and learning problems. If we are interested in influencing the teaching-learning process in the classroom positively we may have to start with improvements in the ways pupils are assessed. This can indicate what is not being understood and assimilated, and can point the way to strategies to improve levels of achievement.

Any assessment system provides opportunities for teachers, pupils, and educators (e.g. curriculum developers, examination-/testing specialists) to monitor progress and learn from failures as well as successes. However, if large parts of examinations consist mainly of straightforward recall questions where pupils are simply asked to reproduce from memory, opportunities for a more comprehensive assessment of learning outcomes are lost and much

teaching will follow objectives narrowly defined by a restricted range of questions. The mere recollection of facts or names does not give any hint of the pupil's problem-solving skills, often so strongly emphasized in the primary school curricula as essential outcomes of learning. Repetition of whole sections from textbooks fails to indicate whether learners are able to apply their knowledge and skills to different situations. Poorly constructed multiple-choice tests leave much space for guess work and may encourage rote learning. They need to be replaced by a broader concept of assessment testing more complex cognitive processes. Consequently, the first step in a reform of conventional examinations is to analyse existing tests in terms of whether and to what extent they contain items requiring higher-order thinking and application. The next step is to develop or improve test items which examine pupils' abilities to apply what they have learned to less familiar situations and problems or which require them to link events or facts to each other in a consistent way.

The development and design of test items is mainly the domain of examination specialists and/or curriculum developers. The work of all those involved in examinations should, but often does not, include a strong research component in order to find out what kind of assessment procedures deliver the most valid and reliable results efficiently and have the greatest positive influences on classroom teaching. Educationists responsible for the design and analysis of national examinations in eastern and southern Africa are trying hard to improve their assessment systems and to answer the challenges of new ideas and requirements.³ During recent years new subjects were added to previous core subjects, i.e. like Languages and Mathematics. In many primary school systems History, Geography and Civics or Social Studies have been included, along with science based subjects like Science, Agriculture, Environmental Science, Home Economics. Most or all now feature in the national examinations. Writing meaningful tests for the more practical subjects which go beyond recalling facts requires familiarity and experience with the respective school curriculum as well as with the possibilities and limitations of different types of assessment. Often the demanding curriculum objectives of subjects like Science or Agriculture are not easily tested in an appropriate way. Developing test items assessing pupils' understanding and application of knowledge and skills to new situations require sophistication in constructing assessment instruments even where testing is restricted to multiple-choice questions for reasons of cost and administrative feasibility.

¹ See Njabili, Agnes F. (1993) Public Examination: A Tool for Curriculum Evaluation. Mture Publishers, Dar-es-Salaam.

Education experts responsible for revising national examinations to improve the quality of education can learn from the approaches adopted to reform in different countries in the region, particularly in the following areas:

- widening the range of skills tested and the instruments used;
- redesigning examination items to include more which test skills of higher-order thinking;
- gradually shifting the basis of testing from a norm-referenced to a more criterion-referenced system (measuring pupils' success or failure in relation to criteria which represent competencies independent of the performance of other pupils);
- considering the possibilities for introducing continuous assessment alongside or instead of terminal examinations, and using pupils' records and
- profiles which can reflect the acquisition of demonstrated competencies of a wider range of different types than can conventional examinations.

One country in the eastern and southern African region has over many years spearheaded new developments in using national examinations for monitoring and meaningful assessment purposes. Kenya started reforming primary education examination in 1974 with the declared aims of making the examination more relevant, improving the quality of education and ensuring greater equity in the access to secondary schools. Two major strategies for reform were employed; changing the content of the examination papers, and introducing an

information-feedback system. »It was hoped that changes in the questions set would make the CPE more relevant as a leaving examination, more equitable to pupils in less-privileged socioeconomic groups, and more reliable as a selection instrument. The introduction of an information-feedback system would, it was hoped, do something to improve the overall quality of the primary school system and to reduce quality differences between high performing and low performing schools.«⁴

⁴ Somerset, Anthony (1988) Examinations as an Instrument to Improve Pedagogy. In: Heyneman, Stephen P. & Fägerlind, Ingemar (eds) University Examinations and Standardized Testing - Principles, Experiences and Policy Options. World Bank Technical Paper No. 78, Washington D.C., pp. 171-194, p. 174

The experience and expertise developed in Kenya over nearly twenty years is therefore very relevant to the present discussion on revising national examination systems in other countries of the region. The Kenya Certificate of Primary Education can serve as an example of possibilities and as entry point to become acquainted with assessment techniques at the end of primary school in the subjects SCIENCE and AGRICULTURE, and for monitoring primary schools in general.

The success of the reform of the primary school examination system has not been achieved without problems. Over the years Kenya has become more and more »exam-ridden«. The results of primary or secondary school examinations receive more and more public attention. Even to the extent that candidates' results are announced over public radio! Regions and school districts compete vigorously to top the lists in the national examinations, very often to the disadvantage of pupils who are unlikely to score highly and those who succeed but do so as a result of long hours of repetitive 'cramming'. The incentives to cheat and find illegal means to pass the test have also created many problems. Heavy emphasis on examinations leads to a neglect of the broader pedagogical tasks of the schools. The school curriculum may be only taught according to the importance of examination subjects and other aspects of the national examination ignored. The »examination tail is wagging the curriculum dog«! John Keeves reminds us of the real purpose of national examinations, »There is little doubt that a national examination has a substantial influence on the teaching that occurs in schools not only during the year at the end of which the examination is held, but in all years that have gone before... it is important that the examinations should have beneficial effects on the teaching and learning that takes place at all earlier stages of schooling«⁵

⁵ Keeves, John P. (1994) National examinations: design, procedures and reporting. UNESCO: IIEP, Paris, p. 98.

The design and conduct of national examinations is therefore not an affair of one group of specialists alone. Examination specialists, curriculum developers, psychometrists and teachers have to cooperate to maximize the beneficial influence of the examinations on practical teaching and avoid excessive testing and examination preparations in the schools. Despite all good intentions on behalf of those setting the national examinations it seems to be extremely difficult to prevent examination »fever« once such examinations have gained too much importance in society as the means through which credentials are obtained, promotion through the school system rationed, and jobs in the labour market allocated.

The manual on IMPROVING TEST DESIGN tries to assist those educationists who are responsible for the design, conduct and control of national examinations in developing higher quality assessment instruments which can provide better information on pupil achievement, a fairer basis for selection, and influence learning and teaching to improve educational quality. It can also be used as a kind of source for training those assisting in the development or processing of examinations. The manual consists of two parts:

Volume 1: Constructing Test Instruments, Analysing Results and Improving Assessment Quality in Primary Schools in Africa,

Volume 2: Assessment of Science and Agriculture in Primary Schools in Africa; 12 Country Cases Reviewed.

Both volumes are the result of two pilot training workshops in Kenya dealing with the development of test items for Science, Agriculture, and Environmental Science and the use of national examinations for improving the quality of primary education. These workshops were jointly organised and conducted by the German Foundation for International Development (DSE), Education, Science and Documentation Centre, and the Kenya Institute of Education (KIE) in cooperation with the Kenya National Examinations Council. Participants came from different countries in eastern and southern Africa. Each country invited was asked to nominate one curriculum developer and one examination specialist, thus guaranteeing that the curriculum aspects for Science, Agriculture, Environmental Science were equally considered with the examination requirements.

Volume one deals with the practical aspects of test construction, analysis and the improvement of assessment procedures. In addition Prof. Keith Lewin (University of Sussex) takes up some of the theoretical aspects, especially the possibilities and limitations of criterion-referenced assessment and test development in general. The practical exercise on developing and administering tests draws to a large extent on the experiences with assignments carried out during the second training workshop in Kenya, where participants designed test items, conducted tests in primary schools and analysed the test results in groups. The experiences of twenty years of examination reform are presented in two analyses authored by education specialists from the Kenya National Examinations Council and the Kenya Institute of Education. Finally, abstracts and papers are documented indicating the discussion and direction of examinations and test constructions in eastern and southern Africa.

Volume two starts with an account and analysis of the present situation regarding primary school leaving examinations of countries in the region. Detailed information for each country is provided in a tabulated overview illustrated by original examination papers in Science, Agriculture and Environmental Science mainly from 1993 and 1994. In few countries Science and Agriculture feature only as part of a larger »General Paper«. In these cases the items covering Science or Agriculture have been included in the documentation. South Africa and Namibia are also included, although presently they have not yet started end-of-primary examinations, but discussions on the composition and design of examinations are in progress. Furthermore, examples of follow-up communications after the examinations from different countries are presented.

2. End of Primary School Examination in Eastern and Southern Africa - An Overview

Udo Bude

The evaluation of pupil's learning achievements is an essential part of the school curriculum. However, methods and scope vary among and within countries. Information on how schools and teachers carry out their tasks as suggested in curricula is of great importance to educational planners, curriculum developers and examination specialists in ensuring acceptable standards of attainment and in guiding the improvement of the quality of education.

In most countries of eastern and southern Africa the dominant tradition is to use formal examinations as a means of assessment at both individual and school level. Very often such examinations consist of a mixture of aspects of assessment procedures inherited from colonial systems mixed with recent developments in assessment methods. In the following chapter we will focus on examinations taking place at the end of primary schooling in the region. Children finish their first school cycle after seven or eight years. They are expected to sit examinations that test mainly their knowledge and skills in Languages and Mathematics, and in a range of subjects ranging from History and Geography to Religion, Science and Social Studies. Sometimes Science is a separate subject, in other cases it is examined with one or more others.

Tests in Education

Formal examinations and tests have not always been a part of education. The first formal examination in a university occurred at the University of Bologna in 1219. Oral exams were a part of the European university systems from the middle of the seventeenth century, and in 1803 formal written exams were introduced at Oxford University. The efforts of Joseph M. Rice in the late 1800s were instrumental in establishing standardized tests as part of the American educational system. Rice was trained as a physician, but he spent most of his professional life developing tests to assess educational achievement. Another significant figure in the history of educational tests is E.L. Thorndike. In the early 1900s Thorndike and his students at Columbia Teachers College contributed tests of arithmetic, handwriting, spelling, and other academic abilities. Today, routine achievement tests are a part of virtually every academic endeavor.¹

Note: Achievement tests were already applied over 2000 years ago in China. Candidates had to pass a public examination for the entry into the Chinese Imperial Service.

¹ Graham, John R./Lilly, Roy S. (1984) Psychological Testing. Prentice Hall, Englewood Cliffs, New Jersey, USA, p. 6.

The primary school leaving examination is usually only the first of a series of examinations that take place throughout the educational system. But even at the age of twelve to fourteen such an examination determines the future of many children and is also valued by many communities as an indicator of teachers' abilities and of school quality. Consequently, teachers as well as pupils put great effort into the preparations for the examinations, the more so because in most countries only the results in the final examination count for certification and selection for secondary school.

Examinations have a tremendous influence on classroom instruction, particularly in the years immediately preceding the end of primary school education. Where there are hardly any paid jobs available after primary school and secondary places are limited, the competition to enter secondary schools becomes more and more intensive and the all important terminal examination the centre of attention. In the end the backwash effect of this examination may penetrate the whole primary education system. Not surprisingly, one even finds teachers in

standard/class 1 of primary schools trying to encourage pupils to practise multiple-choice questions once their pupils have learnt to master the very basics of the 3 Rs. In some countries formal tests are even being arranged in kindergartens.

Teachers know that they have to assess their pupils to build up a detailed understanding of each student's strengths and weaknesses. Without such formative knowledge teachers cannot be in a position to help and to assist. Summative testing is also valued and seen as an indispensable part of teaching allowing overall judgement on the successful attainment of educational objectives. Teachers often question why such testing cannot be left completely to them. One reason is designing meaningful and valid tests is not an easy job. If simple »pencil-and-paper« tests are conducted by teachers as the only means of assessing pupils' performance this will not do justice to the complexity of the learning objectives set out in the curriculum. Nor is it likely to be technically sound as a valid and reliable measurement given that few teachers are adequately trained in test design and many have no formal training at all.

Furthermore, there is concern that over reliance on teacher set tests may undermine balanced teaching of the curriculum because teachers may give undue emphasis to some parts while neglecting others. In the end those parts of the total school curriculum which are tested may be the only parts that are taught, and each teacher may value different topics.

Examinations rarely cover the full range and depth of the curriculum prescribed for the different subjects. Thus, what should have been learned is only partially examined. In many countries in eastern and southern Africa the examination questions set over the years come to define the school curriculum in the last two years of primary school in a narrow and stereotyped way.

»Teaching to the test«

Examinations and testing programmes have grown and multiplied with the expansion and diversification of participation within education systems and probably also as the consequence of an increasing demand for information on the development of 'human resources' in the wider economy and society. Most of them have probably not been specifically designed to help improve learning as such, but simply to verify or 'assess' whether the student has certain knowledge, values and attitudes, skills or capabilities. Both of the two main types of assessment information -criterion-referenced (can X and Y do Z?) and norm-referenced (can X do better than Y on Z?) - are clearly in demand though for different purposes. Within education systems, in cases where resource constraints require that only a limited number of individuals within a given reference group (e.g., a cohort or class) be selected for particular courses of study, the demand is for norm-referenced information; when teachers simply need to know if students have acquired prerequisite knowledge and skills before progressing to more advanced stages of learning, the demand is for criterion-referenced information. In both cases the student is challenged to perform a certain task or tasks, and there is little doubt that the prospect of such a challenge can provide a stimulus to learning. Indeed, the major end-of-cycle public examinations in many countries often are the cause of anxiety and even anguish among parents as well as students because they are so determining for life chances.

If, as is common, the knowledge and skills assessed by examinations are the ones that teachers, students and parents concentrate on to the exclusion of what else is in the curriculum, then there occurs the biggest single unwanted side-effect of external assessment. Proponents of 'measurement-driven' or 'assessment-led' instruction have argued that if 'teaching to the test' produces higher test scores, then at least some learning has occurred. Critics have questioned whether those higher test scores represent useful and enduring learning which will convert into future achievement -as opposed, say, to mere memorization of facts which are quickly forgotten. Despite the amount of testing going on in the world, many scholars probably would agree that there still is very little known about whether preparing for and taking tests actually causes useful and enduring learning to occur.²

² from: UNESCO (1991) World Education Report, pp. 82, 83

The heavy reliance of developing countries on external examinations is in great contrast to experiments in some European countries aimed at abolishing formal examinations at primary school level and replacing them by more formative, school-based and pedagogically integrated assessment. In Switzerland, for example, an experimental project has started where children's progress was regularly evaluated through diagnostic methods (see Box). Such a demanding approach, however, requires teachers with sufficient professional experience and a thorough academic and pedagogic background.

In Switzerland, interesting experimental work is taking place which appears to have general applicability to the problem. Research there and elsewhere has shown that the traditional evaluation of pupils' performance often fails to achieve its objectives. Commonly, it does not help the pupils to improve, it does not accurately inform parents of their child's progress, and it does not give sufficient information to educationists to enable them to plan the child's educational future. Difficulties arise partly because the main function of marking is not clear; there can be no single all-purpose mark that is simultaneously predictive, a credentialling device, and a diagnostic tool, but that is what teachers have tried to employ. In primary schools, the process of assessment is also sometimes distorted by marks being used to punish or reward. In addition, teachers find it difficult to transform a record of under-achievement into a prescription for remedying it.

The Swiss research indicates that while formal evaluation instruments and data banking have a role to play, the main solution lies elsewhere. Thus, in one experimental project, teachers were encouraged to prepare their own diagnostic tests, and marks were not given though mistakes were carefully analysed and explained to the pupil. Twice a year remarks, not grades, were entered in parents' notebooks giving an account of the child's progress. Each June an evaluation of the whole year was noted in the pupil's record. Teachers recorded the achievement made during the year but there was no comparison between pupils - in other words, the purpose of this evaluation was diagnostic not rank-ordering. Surveys showed that parents and teachers favoured the new evaluation despite the work load involved, but there was a clear need for teachers to receive more training with a view to encouraging them to discard their old ideas about marking, and to develop their skills in being more precise about objectives and in the construction of their own diagnostic materials. The great advantage of this evaluation project has been the emphasis on the professional expertise of the teachers and their need to communicate more effectively both with pupils and with their parents. At primary level, it has been considered appropriate to give the diagnostic function of evaluation priority over the other functions.³

³ OECD (1989) *Schools and Quality. An International Report*. Paris, p. 102

Such well-trained professionals are, under normal circumstances, not available in developing countries and their lack would easily jeopardize such an approach.

Investigation of the end of primary school examinations in the Africa region reveals that most of the countries have started reforming their examinations in recent years, particularly since 1990. Countries are well aware of the limitations of examination systems that depend heavily on multiple-choice tests. There is a great need and demand for reviewing and redesigning the written examinations to reduce simple recall items to a minimum and include more items that test higher cognitive skills. The latest trends include:

- experiments with continuous assessment, and
- introduction of more criterion-referenced tests.

Swaziland has been experimenting with continuous assessment in primary schools for three years. The trials cover English and Mathematics and are intended for the full primary school cycle (up to Std. VII). Criterion-referenced tests were introduced to assess the performance of individual pupils. The trial programme aims at improved quality of teaching and hopes to reduce repetition and dropout rates. At the same time it is planned to extend the primary basic education cycle from 7 to 9 years with a final examination at the end of Std. IX. The major constraint to the implementation of continuous assessment is the low level of teachers'

training. The introduction of forms of continuous assessment in the primary education system is also envisaged in Uganda. However, Uganda's Examinations Board is aware of the problems involved, especially of the need to sensitize and train teachers thoroughly and to establish spot-checks and controls at local level. In addition a national assessment exercise is planned every two years to determine country-wide levels of performance (to find out about rising or falling standards).

Lesotho's experiences with continuous assessments have had less success. The trials did not encourage a general country-wide introduction. Teachers were unable to handle the assessment instruments correctly. Children were promoted without ensuring appropriate learning outcomes. Thus, the usual end of primary school examinations have been retained.

Because of the limitations of the norm-referenced testing system Botswana began in 1992 to experiment with criterion-referenced testing. It is hoped that a shift from the present testing strategies to criterion-referenced testing will ensure that the examinations mirror the aims and objectives of the primary school curriculum more closely. The new examination will be supplemented by a process of continuous assessment.⁴

⁴ See: Ministry of Education, Department of Curriculum Development and Evaluation, CRT Implementation Committee (1992) Criterion-referenced Testing. Rationale for Implementation. Republic of Botswana.

End of Primary School Examinations in Eastern and Southern African Countries												
Country	Title	Institution setting examination questions	No of pupils sifting exam in 1994	No of subjects tested	No of papers in exam	Language of exam (except language papers)	Items pretested		Year of latest exam reforms	Children's entry age in primary school	Duration of primary school	Amount of fees charged (in US\$)
							yes	no				
Botswana	Primary School Leaving Examination	Dept. of Curriculum Development & Evaluation, and Examinations, Research & Testing Division	36,158	5	5	English	X		1991	7	7	-
Kenya	Kenya Certificate of Primary Education	Kenya National Examinations Council	395,765	14	7	English		X	1985	6	8	4.5
Lesotho	Primary School Leaving Examination	National Curriculum Development Centre	31,396	8	5	English	X			6	7	2
Malawi	Primary School Leaving Certificate Examination	Malawi National Examinations Board	103,833	11	8	English		X	1995	6	8	
Swaziland	Swaziland Primary Certificate	Swaziland Examinations Council	17,888	9	11	English	X		1970	6	7	10
Tanzania	Primary School Leaving Examination	National Examinations Council of Tanzania	384,762	9	3	Kiswahili		X	1994	7	7	-
Uganda	Uganda Primary Leaving Certificate Examination	Uganda National Examinations Board	162,695	6	4	English	X		1983	6-7	7	2
Zambia	Grade 7 Composite Examination	Examinations Council of Zambia	179,148	6	5	English	X			6-7	7	1
Zanzibar	Form 1 Entrance Examination	Ministry of Education, Dept. of Higher, Science & Technical Education	7,189	9	?	Kiswahili		X	1993	7	7	-
Zimbabwe	Grade 7 Examination	Examinations Branch, Ministry of Education and Culture	306,706	6	4	English	X		1990	5 ^{1/2} -6	7	-

Note: Namibia and South Africa have not been included. In Namibia presently examinations only take place after junior secondary school (class 10); primary school examinations are planned for 1997. In South Africa the Independent Examinations Board, a non-governmental organisation, offers national examinations since 1994 for Std, VII leavers. Common exams are also set by the Provincial Departments of Education.

Zambia is the only country in eastern and southern Africa which includes in the Grade VII Composite Examination at the end of the primary education two papers testing verbal and numerical reasoning. In English and Mathematics pupils are asked to answer 50 questions for each subject. The multiple-choice items can be answered in 60 minutes for English and in the same time for Mathematics.

Tanzania has seen changes in the structure of the primary school examination over the last years. For reasons of examination security the country used to be divided into different zones, controlled centrally from the capital. From previous five zones in 1990 the »examination zones« were gradually reduced to two in 1993. For each examination paper different versions are produced according to the number of existing zones by the National Examinations Council. Since 1994 Tanzania has produced only one set of examination papers for the whole country. This development was accompanied by the creation of examination centres in the regions and the compulsory presentation of candidates' photographs for identification purposes.

The number of subjects tested in the end of primary school examinations in the different countries of the region range from 14 (Kenya) and 11 (Malawi) to 6 (Uganda, Zambia, Zimbabwe) or 5 (Botswana); 8 subjects are tested in Lesotho and 9 in Swaziland and Tanzania, including Zanzibar. However, these subjects do not necessarily feature in the examinations with papers of their own. Only the main subjects, like Languages and Mathematics appear as separate papers, all others are presented in combination with other subjects. The general impression prevails that the greater the number of subjects combined in one paper, the smaller the range of the subject's curriculum covered in the test. Zimbabwe e.g. tests three subjects in a combined General Paper (Religious & Moral Education/Social Studies/Environmental Science) with the result that the whole curriculum of each subject has to be reflected with 15 or 20 questions!

Pupils in all parts of the United Republic of Tanzania receive their examination questions in the national language Kiswahili, and can answer in the same language. In all other countries of the southern and eastern African region English is used as the official language, English is required for understanding and answering the tests. Only the papers in the local/regional language subjects use the respective languages as the medium of education and assessment.

The test items for the different subjects are either developed by national examination boards or councils or by national curriculum centres. In Lesotho the national curriculum centre is responsible for setting the examination questions. All other countries of the region charge the national examination boards or councils with this task. Over the years different procedures for setting the examination questions have emerged. As a rule, specialists from different educational institutions like curriculum development centres, examination boards, teacher training colleges, universities and sometimes practising teachers etc. are invited to forward sample items which are later moderated by specialists, sometimes trial tested and analysed and finally compiled for the annual examination paper. Nearly all countries try to involve experienced primary school teachers and inspectors at this stage. Only Malawi and Tanzania refrain from using practising primary school teachers' experience for the design of test items.⁵ Half of the countries appear to analyse pre-test results in the development of items.

⁵ See also table 2: Groups involved in setting examinations.

CRITERION-REFERENCED TESTING	NORM-REFERENCED TESTING
ADVANTAGES	
<ul style="list-style-type: none"> • Fair and informative to students, parents, and educators. • National educational progress may be evaluated meaningfully in terms of increased achievement. • Career guidance information can centre on specific abilities fostered by the curriculum. • Diagnosis of individual's deficiencies in relation to curriculum objectives is more possible. • Meaningful curriculum-based continuous assessment of students that are comparable from school to school are possible. 	<ul style="list-style-type: none"> • Readily reflects the achievement of each examinee in relation to the norm group. • Smaller samples of content can provide sound comparisons of student's relative achievement, provided large samples of students are used. • May promote student competition and competition between schools that is based on relative standing in the norm group.
DISADVANTAGES	
<ul style="list-style-type: none"> • Student achievement is not so easily compared. • Smaller samples of content provide weaker generalisations about a student's performance in the curriculum domain. • May discourage student competition that is based on relative standing in a norm group. 	<ul style="list-style-type: none"> • Fair but less informative regarding what levels of achievement were attained. • National progress may be evaluated but comparisons over the years are difficult. • The information obtained may be less helpful to target in-service training to specific aspects of the curriculum. • Diagnosis limited to broad areas of curriculum (e.g. Math vs English) and in terms of a student's curricular strengths relative to other students in the norm group. • Curriculum-based continuous assessments are less meaningful and limited to relative standing in the local classroom.
<p>Note: Adapted from Ministry of Education, Department of Curriculum Development and Evaluation, CRT Implementation Committee (1992) Criterion-referenced Testing. Rationale for Implementation. Republic of Botswana, p. 13</p>	

Many members of the groups involved in setting examination questions for the end of primary education as indicated in table 2 may have no formal training in assessment and simply draw on experience.

Country	primary school teachers	secondary school teachers	school inspectors	TTCs tutors	University lecturers	Curriculum developers	Examination specialists
Botswana	X		X	X		X	X
Kenya	X			X			X
Lesotho	X		X			X	X
Malawi		X	X	X		X	
Swaziland	X		X	X	X	X	
Tanzania							X
Uganda	X		X	X			X
Zambia	X	X	X	X		X	
Zanzibar	X		X			X	X
Zimbabwe	X		X			X	X

A closer look at the situation of science subjects in the end of primary school examinations reveals that Science features in all examinations, but the importance attached to this subject differs from country to country. Science is either a compulsory paper like Mathematics and Languages (e.g. in Botswana), or is part of a compulsory »General Paper« (e.g. Tanzania, Zimbabwe), or appears only as an optional paper in the examination (e.g. Malawi). To stress the importance of Science in primary education and ensure appropriate teaching, the discussions in Zimbabwe have resulted in proposals to establish Science as an additional compulsory paper in its own right, rather than to examine it with Social Studies and Religious Education which are not cognate subjects.

Table 3: Science Subjects in End of Primary School Examinations

Country	Subject paper	Type of items	No of questions	Time available for subject (minutes)	Remarks
Botswana	Science	Multiple-choice (4 options)	60	60	Agriculture not examined in Primary School Leaving Examination.
Kenya	Science & Agriculture	Multiple-choice (4 options)	60	120	30 questions for each subject.
Lesotho	Science	Multiple-choice (4 options)	70	90	Agriculture included in Science paper.
Malawi	• Science and Health Education	Short answers	31	120	Answers in English/From 1995 on only one paper called »Science Incorporated« (incl. Science, Agriculture
	• Agriculture	Short answers	25	120	and Health Education) will feature as an optional paper in the exam consisting of multiple-choice items.
Swaziland	• Science				Two papers are given in Science, one with multiple-choice items, one requesting short answers in English. Agriculture is examined as an additional optional paper.
	Paper I	Multiple-choice (4 options)	40	90	
	Paper II	Short answers	6	120	
	• Agriculture				
	Section I	Multiple-choice (5 options)	30	90	
	Section II	Short answers	12		

Country	Subject paper	Type of items	No of questions	Time available for subject (minutes)	Remarks
Tanzania	General Knowledge incl. Science	Multiple-choice (5 options)	20	30	General Knowledge paper consists of History, Geography, Civics, Science, Agriculture, Health and Home Science. 20 questions for Science.
Uganda	Basic Science and Health Education	Short answers	55	135	Answers in English; Agriculture included in the Basic Science and Health Education paper.
Zambia	Environmental Science	Multiple-choice (4 options)	50	60	Agriculture included in Environmental Science paper.
Zanzibar	Science				Agriculture not examined.
	- Section A	Multiple-choice (4 options)	20	90	
	- Section B	Short answers	6		
Zimbabwe	General Paper incl. Science & Agriculture	Multiple-choice (5 options)	20	40	General paper consists of Religious & Moral Education, Social Studies, Science & Agriculture.
Note: Tabulation based on the 1994 examination papers.					

Agriculture as a separate subject in the examinations faces even greater problems finding adequate recognition. Only one country does not include Agriculture in the examinations (Botswana), but in most cases the subject is included as a subtopic in the compulsory Science or General Paper. Agriculture appears as a separate, but optional paper only in Swaziland.

Throughout the countries Science and Agriculture are tested in the national examinations with using multiple-choice questions. The latest country to adopt this style of testing is Malawi which started applying such items from 1995 on. The decision to use multiple-choice items in the examination was preceded by two research analyses of the previous examination system.⁶

⁶ See: Chimwenje, Catherine (1993) Evaluation of the Primary School Leaving Examination in Malawi: How the Examination meets its educational and selection Goals. PhD-thesis. Univ. of Sussex/England; Bradbury, Richard (Oct. 1992) Primary Science School Leaving Examinations. Malawi-German-Primary Science Project, Occasional Papers No. 1.

The opposite happened in Uganda, where 1983 multiple-choice questions in the examinations were completely abolished and pupils had to get used to giving short answers in English to each item. As a consequence of this revision the number of questions was reduced allowing more time for the written statements from pupils allowing assessment of a wider range of attainments. Swaziland has tried to compromise between multiple-choice and open-ended questions by combining both. Science as well as Agriculture are tested in the end of primary examination with two papers each. For example the Science test consists of a paper with 40 multiple-choice items and another with six questions where short answers are expected.

What kind of multiple-choice questions are used in the examinations? The claims of those responsible for the design of the examination papers do not match the results shown by analyses of the actual papers intended to test pupils' performances in the science subjects. With the exception of Kenya all the other countries appear to include large proportions of recall questions in Science and Agriculture. On average two thirds of the test items fall under this category. Questions which test pupils' ability to apply what they have learned to new situations, or which require an understanding of how facts are linked to one another, are much less frequent, and in most countries account for 25 to 35% of all Science questions. The case of Kenya demonstrates that the application of skills and knowledge acquired in schools can be at the centre of the examination with 50 to 60% of all items intended to work at this level. This leaves a substantial proportion of the total number of questions to test higher order skills (10-20%).

The structure of examination questions in the science subjects shows a clear concentration on those multiple-choice items testing simple knowledge. Higher-order skills or the capacity for applied thinking are rarely tested. The good intentions of those setting the examinations to evaluate achievement based on the educational objectives of subject curricula seem to run into difficulty when skills are valued which require evidence of comprehension, application and communication skills. In a provisional analysis of Environmental & Agricultural Science in the national primary school Grade 7 Examination in Zimbabwe, Lewin shows that most items he analysed in the General Paper required only the recall of information. Knowledge items accounted for 66% of all Science items, comprehension items for 28% and application items for only 6% of the total items in the 1990 and 1991 examinations papers. »Though the skills of comparison and classification can be tested with multiple-choice items they appear not to be. There are very few items that deal with measurement skills. A small number of items are concerned with interpreting data. Thus opportunities seem to have been missed... to interrelate the cognitive demand of examination items with the science skills identified in the syllabus document«⁷ Although most of the countries only use multiple-choice items for their tests in Science and Agriculture, examination specialists are aware of the limitations of such a test method, particularly with regards to encouraging the expression and originality of the pupils.

⁷ Lewin, Keith (May 1992) Provisional analysis of national examination papers 1990 and 1991, Environmental and Agricultural Science in Zimbabwe. Preliminary analysis, p. 4.

All countries of the region included in this survey report different performances of girls and boys in the end of primary school examinations. On average girls achieve lower scores than boys. There is some evidence that boys perform better on multiple-choice questions, whereas girls show greater talent in free response items.⁸ It is also probable that, since no examination construction procedures specifically filter out items with strong gender differentiation in performance, that differences in performance are partly a result of the way items are chosen. The 30 items developed during the training workshop in Nyeri/Kenya in 1994 and tested in six different primary schools with more than 300 pupils showed gender differences in pupils performance. This mock-examination in Science/Agriculture indicated that boys did much better in all items referring to more abstract/technological questions (levers, pulleys etc.). Girls however did significantly better on weather recording (charts) and on agricultural problems dealing with maize growing. Interestingly in the best performing school where girls and boys are boarders from Std. I and enjoy the advantages of a well-staffed and well-equipped elite school, girls and boys scored equally highly on all items. Systematical checks of test items to prevent gender biases are still to be included in the designs of primary school leaving examinations.

⁸ See also Keeves, John P. (1994) National examinations: design, procedures and reporting. UNESCO: IIEP, Paris, p. 71.

Multiple-Choice Items

Advantages:

- Because multiple-choice questions take little time to answer, a test can measure a broader range of content than is possible with a test which relies solely on essay items or performance tasks.
- They are less costly to score. If specially prepared forms are used, they can be machine scored, allowing thousands of answer sheets to be scored in a very short period of time. Marking is also more reliable.
- They are an efficient way to measure recall of factual knowledge and some skills.

Disadvantages:

- It is more difficult to design multiple-choice questions which measure higher levels of thinking and problem solving.
- It is more difficult to design questions which measure more complex, real-life types of skills and thinking.
- They take more time to develop because of the need to construct four or five response choices.
- Multiple-choice tests promote multiple-choice teaching - that is, teaching where students are always looking for the one right answer.
- There is a significant chance of being able to get the correct answer by guessing, which is not the case with performance tasks or essays. If a multiple-choice question has four options, the student has a 25 percent chance of guessing the item correctly. Though this may not change the rank order of pupils, it may give a misleading impression of actual achievement.⁹

⁹ Adapted from Capper, Joanne (March 1994) Testing to Learn... Learning to Test. A Policymaker's Guide to Better Educational Testing. Executive Summary. Academy for Educational Development, Washington, D.C.

Further efforts are needed to ensure that end of primary examinations are of a high quality and help at the same time to improve meaningful teaching/learning in primary schools. The application of multiple-choice questions in national examinations influences classroom teaching. »If the examination primarily contains items which have students selecting from among options, then students are likely to spend much of their time preparing for the test with worksheets in which they select the correct answer. This type of behavior is less likely to help students make the extensive web of mental connections which help them to understand and use what they learn in school«. ¹⁰ Future examination reforms need to pay attention to three priority areas:

- (1) Devising assessment tasks which are stimulating and test active, problem-oriented thinking, in valid and reliable ways;
- (2) selecting questions which are as fair as possible to all groups involved (especially to girls, pupils living in remoter or rural areas, and to pupils from less privileged socio-economic backgrounds);
- (3) including some open-ended tasks in the assessment process to avoid sole dependence on multiple-choice questions (see BOX »Multiple-Choice Items«).

¹⁰ *ibid.*, p. 23.

Over the last decade one country in the region has successfully improved the internal quality of the examination at the end of primary education to make examinations more meaningful and relevant to the things taught in school based on the curriculum. By changing the type of questions asked in the Kenya Certificate of Primary Education examination from simple recall questions to items testing intellectual skills, the examination reform has supported curriculum changes. »... the whole success of such an operation in Kenya, as elsewhere, depends on building up the skills not only of those who devise the items but also ultimately of the children who read them, since a 'thinking type' question almost invariably employs more difficult language structures than a 'recall type'«. ¹¹

¹¹ Hawes, Hugh & Stephens, David (1990) Questions of Quality - Primary Education and Development. Longman, p. 170.

Another problem causes even greater headaches. The increasing importance of examinations has negative repercussions on classroom teaching and leads to all different kinds of manipulation during and after the examinations. Uganda's National Examination Board reported a situation typical for nearly all other countries:

- Primary schools concentrate solely on those subjects featuring in the national examination;
- those subjects not tested in the examination (like Art & Crafts, Music, Physical Education) disappear from the schools' timetable;
- children spend much more time in school than officially planned, because of many mock-examinations;
- even during vacations tutoring (against payment) for examinations takes place in schools;
- private coaching clinics for end of primary school examinations flourish;
- examination cramming texts are bought in preference to official curriculum materials.

Similar experiences are also reported from Kenya. The struggle for being amongst the top performing primary schools in the country and having as many pupils as possible placed in the country's elite secondary schools has produced a classroom situation where children are continuously assessed through written examinations throughout the year. Mock-examinations are designed and set by a panel of teachers and parents have to pay fees for those »tests«. On the average children write nine examinations per year and subject. The third term of the last year in primary school is completely devoted to former examination papers of the Kenya National Examinations Council. Thus, large parts of the curriculum for Std. VIII are not covered properly. Every administrative unit (zone, division, district) organises special mock-examinations to provide as much opportunities as possible to getting prepared for the final national examination. Most worryingly perhaps, practical activities which provide opportunities to apply knowledge and concepts are relegated to occasional activities with little coherent purpose.

In many countries, much more effort needs to be made to ensure that the examinations are of the highest possible quality. Apart from the psychometric qualities of validity and reliability, the following three criteria are suggested for judging the quality of examinations.

- **Active thinking.** Testing only recall information is to be avoided. Active ideas are held in the mind as pictures in which elements are linked to each other in patterns. Knowledge-based questions should test understanding of these patterns. Such questions should be concerned with causes, consequences, and reasons; with relationships, trends, and general ideas. In other words with understanding. The assimilation of the knowledge is a characteristic of active thinking. Examinations in some subject areas should include a number of data-based questions requiring students to read and interpret new information. Examinations should also include questions testing the application of knowledge to new situations including drawing

inferences, making predictions, or solving problems. There is always the problem that what is new to one student may not be new to another but, in general, it is possible to construct questions which are known not to be in the major textbooks that have been used. The above points have been well known since Bloom's Taxonomy of Educational Objectives« (Bloom et al, 1956) appeared but surprisingly are often ignored.

- **Equity.** The examination should, to the maximum extent possible, be fair to all groups: to girls, to students living in rural areas, particularly in remote parts of the country, and to those from less-privileged socioeconomic backgrounds. Biases in individual questions are often unavoidable (especially in questions which are experience-based). However the question setters should attempt to ensure that, over the examination as a whole, these biases counterbalance each other as much as possible. This is, however, no easy task. The performance of students in the remote and less privileged schools is nearly always adversely affected by the quality of the education they receive and therefore it is important to ensure that avoidable biases in examination questions do not compound their disadvantage.

- **Open-ended questions.** Even when there is evidence to indicate that, from an assessment point of view, the examination of open-ended questions does not provide additional information for prediction purposes it is nevertheless desirable to include open-ended items simply to ensure that teachers do not only use multiple-choice items. It must also be remembered that it is impossible to assess students' ability to develop a logical argument, to defend a point of view, to write essays and the like with multiple-choice items.¹²

¹² Ross, Kenneth N. & Mählck, Lars (eds.) (1990) Planning the quality of education. The collection and use of data for informed decision-making. UNESCO: IIEP. Pergamon Press, pp. 28, 29.

In this way children are continuously assessed throughout their school career, starting with tests in Std. I. Teachers have become so used to these assessment exercises and the related fringe benefits like additional income, that they defend the tests as a necessary means for providing better education and increasing children's chances to pass the examination. As a result teaching/learning in Kenya's primary schools has become examination-oriented to an extent that the pedagogical objectives of the curriculum are more and more neglected. »The learning process is to fit the cut-throat competition for high grades in public examinations. The teachers use all tricks they can to enable their children to perform well in public examinations, including drilling them on how to answer examination questions and giving frequent trial test, known in Kenya as mock examinations«.¹³ To counteract these unhealthy developments the Kenya Institute of Education now tries to design model items to assess children at different stages in primary school to reduce the inflation of mock-examinations and improve their range and quality.

¹³ Mulusa, Thomas (1992) Pluralistic education in sub-Saharan Africa. An Overview. In: PROSPECTS, Vol. XXII, No. 2, pp. 159-170, p. 162.

Pupils' knowledge and abilities can be measured in many ways. Because the different formats of assessment have their advantages and disadvantages some countries try to include various kinds of question formats in their examinations, like Swaziland using multiple-choice items and open-ended questions in the Science paper. Performance tasks are a further possibility to measure pupils' understanding of processes and the ability to demonstrate skills and techniques in real-life situations. »Students at the primary level can learn to classify and observe - two basic and essential elements of the scientific process. Hands-on science tests at this level might involve students in putting seeds and beans into categories and explaining why they selected those categories, or measuring and recording various objects, such as their hands, feet, or pulse rate before and after exercise«¹⁴ The use of performance tasks in examination however faces a number of constraints: Teachers need intensive training and assistance in learning how to teach such tasks, and the administration and scoring is time-consuming, costly and rather complex.

¹⁴ Capper, Joanne, op. cit., p. 20.

Pros and Cons of School-Based Assessment

Arguments can be advanced in favor of and against school-based assessment (Heyneman 1988; Pennyquick 1990). Arguments in favor go as follows:

- Since assessment by teachers is a crucial component of good learning and teaching, every effort should be made to improve teachers' competence in this area (Crooks 1988). If school-based assessment becomes part of the certification process, it is likely that greater effort will be invested in improving teachers' general competence in assessment, and this should have beneficial effects on teaching and learning.
- School-based assessment provides immediate feedback information to teachers on student achievement and teaching effectiveness.
- Since school-based assessment is carried out over time and by a person who knows students well, it is likely to provide a more valid and reliable appraisal of a student's achievements than can a single external terminal examination. In this context, one commentator in Zambia has observed that the school is »the only place where there is enough information to do reasonable justice to a pupil« (Kelly 1986, p. 20).
- School-based assessment permits an extension of the range of curriculum topics to be examined. The present system of examinations limits the range of achievements that can be assessed and must narrow the curriculum in schools. Aspects of achievement that cannot be satisfactorily assessed in a terminal examination include a student's ability to plan and organize a project and persevere with it over time. While the assessment of oral and practical skills may be carried out in a terminal examination, inevitably it will be limited, artificial, and expensive.
- School-based assessment reduces the undesirable back-wash effects of external examinations.
- School-based assessment, if spread over the year, can increase the level of pupil motivation and application throughout the year.

Some of the following arguments advanced against the use of school-based assessment in the certification of students:

- Its use can change the nature of the relationship between teachers and students towards making the judicial aspect of the teacher's role more prominent.
- Marking standards in school-based assessment are likely to vary both within and among schools. While moderation procedures can help, they tend to be expensive.
- School-based assessment can subject teachers to considerable parental pressure, especially during the periods leading up to and immediately after critical public examinations.
- School-based assessment requires teachers to devote more time to assessment and recording.
- School-based assessment gives rise to a variety of administrative problems for schools, such as what to do when students are absent for tests or when students transfer from one school to another.
- Teachers' assessments are subject to a variety of biases.
- In many instances, it is difficult if not impossible to apply school-based assessment to non-school-based candidates.
- Teachers' assessments are often technically unreliable and may have low content and predictive validity.¹⁵

¹⁵ Adapted from: Kellaghan, Thomas and Greaney, Vincent (1992) op. cit., pp. 42, 43.

The assessment of practical subjects in the final examinations poses particular problems. Should e.g. in Art & Craft pupils produce something for the examination or should the progress made over a certain period being continuously assessed and taken into consideration for the ultimate judgement? Some countries have therefore started to experiment with some kind of continuous school-based assessment. The advantages and disadvantages of school-based assessment are well summarised by Kellaghan and Greaney in a study of fourteen African countries (see BOX). Again, as in the case of using performance tasks, teachers need to be trained carefully for this type of assessment. Furthermore, parents and communities must have faith in the fairness of such examination procedures.

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3. Country Reports/Examination Papers

3.1. Botswana

3.1.1. Overview

End of Primary School Examination

1 Title of examination:	Primary School Leaving Examination
2 Amount of fees charged:	Nil
3. Examination after years in primary school (6, 7, 8 years):	7 yrs
4. Children's entry age in primary school:	7 yrs
5. Number of pupils sitting examination in 1994:	36,158
6. Examination subjects offered:	<ul style="list-style-type: none">• Setswana,• English• Mathematics• Science• Social Studies. <p>The Setswana and English papers have an essay component in addition. The other papers are objective papers.)</p>
7. Language of examination:	English (except for Setswana paper)
8. Institution setting the examination questions:	Department of Curriculum Development and Evaluation, and Examinations, Research and Testing Division
9. Have there been any reforms in the examination questions?	Yes
When? (year)	1991
What kind?	The examination papers were nine and they were cut down to five, thus excluding the aptitude testing papers which were previously used for selection. All the questions now test skills prescribed by the curriculum. Criterion-referenced testing is considered for implementation.

- 10. Stages of development of examination questions (please describe):**
- Appointment of Chief Examiner by Examinations Unit.
 - Convening of the item writing workshop, involving primary school teachers, Curriculum Development experts, Examinations experts, Research and Testing experts, and Education Officers.
 - Compilation of the paper by the Chief Examiner.
 - Shredding session comprising Curriculum Development Unit, Examinations Unit, Research and Testing Centre, Chief Examiner and invited educationists.
 - Trial testing.
 - Item analysis.
 - Compilation of final paper by Chief Examiner.
- 11. Type of examination questions and distribution of different kind of questions.**
- Details vary from subject to subject.
- 12. Is continuous assessment incorporated in the final examination?**
- Yes
No
- 13. Are examination items pretested?**
- Yes
No
- 14. Which professional groups are involved in setting the examination questions?**
- Primary school teachers
 - School inspectors
 - Tutors of TTCs
 - Curriculum Developers
 - Research Testing Officers (Technical Expertise)
 - Education Officers (in-service)
- 15. Are the same professionals who set the examination questions involved in marking papers?**
- Yes
No
- The essay components (English and Setswana) of the Primary School Leaving Examination are marked by primary school teachers.
- 16. How are examination results used for improving teaching in primary schools?**
- Examination reports are sent to schools to describe the behaviour of each item during marking and how markers view it generally. The reports of the results are given to Members of Parliament, Education Officers, schools, the district administrators and all government departments. The authorities are motivated for future planning by the type of result achieved.
- 17. To what other uses are the examination results put?**
- They were formerly used for selection to secondary education. With universal access to nine years of Basic Education the selection purpose fell away in 1993.
- 18. Main problem with Primary School Leaving Examinations?**
- ./.

3.1.2. Primary School Leaving Examinations: The Case of Botswana

by Mookgweetsi Masisi, Curriculum Development and Evaluation Department

The Primary School Leaving Examination in Botswana is the joint responsibility of the Examinations, Research and Testing Division, and the Department of Curriculum Development and Evaluation at the Ministry of Education. It must be mentioned at the outset that practising primary school teachers play an extremely significant and active role throughout the process.

Functionally, the Examinations, Research and Testing Division is responsible for the administration of examinations and for ensuring that what needs to be done at various points gets done. The actual development of examination items is carried out at an item writing workshop. Participants of a primary school leaving examination item writing workshop are practising teachers who are selected mainly by their Education Officer in collaboration with the responsible Research and Testing Officer and/or Curriculum Officer. More as a matter of principle than as a rule, upper primary school teachers are selected for the workshop. This is because the examination is constructed from those topics and objectives that are taught in standards five, six and seven. It is primarily the responsibility of the Examinations, Research and Testing Division to ensure that such a workshop gets held, and to ensure that all the necessary critical attributes of test development are given due attention throughout the workshop. The Curriculum Development and Evaluation Department, which takes part in such workshops, is responsible for ensuring adherence to the test plan (curriculum spread). Curriculum objectives or extrapolations of the topics serve as a guide when designing items. The intention is to produce items that are positively related to the stated objectives.

The reality of this is obviously mitigated in subjects that either do not have stated objectives or have »fuzzy« objectives. The Examinations, Research and Testing Division itself plays an enabling role of administration - ensuring that schedules are not disregarded. The same division bears the responsibility for appointing a chief examiner. It is at this state also that the first evaluation by professionals takes place as regards validity of the items. Whilst the Examinations, Research and Testing Division personnel will ascertain adherence to the internal qualities of the items, the curriculum officers as well as the teachers will ascertain the curricular validity of the items in the context of the syllabus and classroom.

Following the item writing workshop, at which items are generated, the chief examiner puts together a draft paper which is presented for discussion at a shredding session. Professional personnel from the Curriculum Development and Evaluation Department, the Examination Research and Testing Division, education officers and teachers are present and take an active part in the deliberations. At such a shredding session, attention is given to the construct, face and curricula validity and the shredding (editing) is undertaken with these in mind. All observations and recommendations are noted by the chief examiner and followed by corrective measures. This having been done, a paper is prepared by the chief examiner who then hands it over to Examinations, Research and Testing Division for trial testing. Through the trial test, analyses of individual items are derived. The trial test establishes the item difficulty. The item discrimination is also established which checks the internal consistency of the test. It is the trial test results together with the professional opinion of the chief examiner and the curriculum officer which determine the ingredients of the final paper.

Stages in Examination Development Process/Item Examples

1. Appoint chief examiner
2. Hold item writing workshop
3. Chief examiner compiles a draft paper
4. Shredding session
5. Chief examiner reconstructs draft paper

6. Trial testing and item analysis

7. Chief examiner constructs final life paper

At this juncture, examples of some items from some past Primary School Leaving Examination papers are in order. The statistics presented with them are the actual ones from their trial testing. Given that Agriculture has only recently been offered at the primary school level and elements of Environmental Science are currently being tested under the auspices of Science, only the Science examples are provided.

Below are five examples from past examination papers.

1. A certain season has the longest days, another has the longest nights. What are they?

- A Autumn, spring .08 -.14
- B Summer, winter .61 .33
- C Spring, summer .12 -.16
- D Summer, autumn .16 -.16

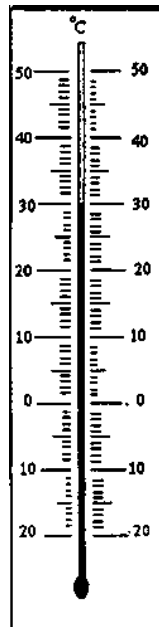
Source: Item 6 Science PSLE 1989

2. During a thunderstorm, light is sensed before sound because

- A light is not as heavy as sound. .13 -.20
- B eyes work more quickly than ears. .05 -.15
- C light travels faster than sound. .75 .33
- D ears do not react as fast as eyes. .04 -.14

Source: Item 7 Science PSLE 1989

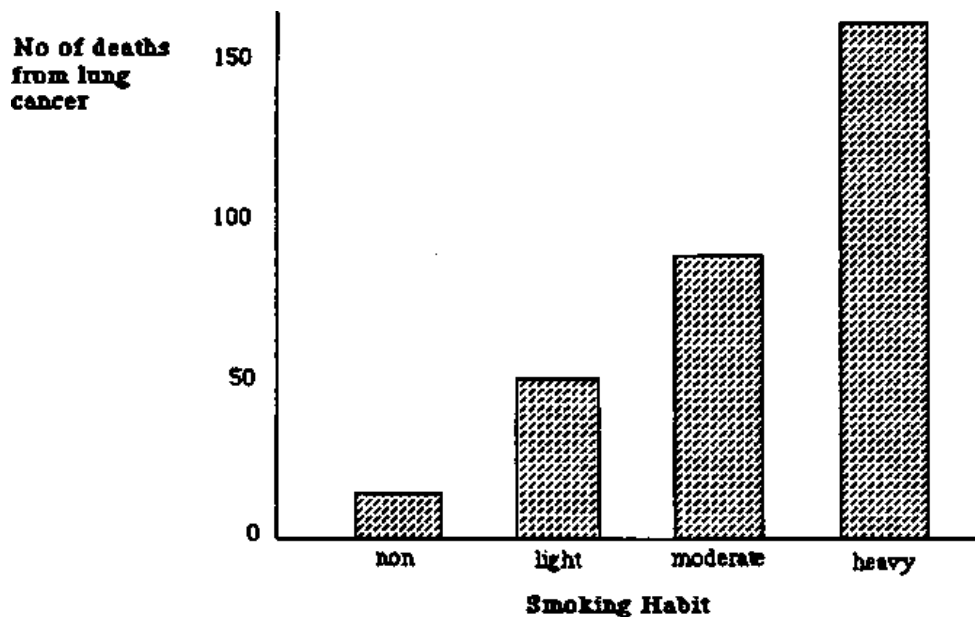
3. What is the temperature shown by the thermometer below?



- A 30°C .22 -.32
- B 31°C .72 .41
- C 32°C .02 -.11
- D 33°C .02 -.15

Source: Item 8 Science PSLE 1990

The graph below shows the smoking habits of people who have died from lung cancer.



4. From the information in the graph which of the following statements is correct?

- A People who do not smoke can also die of lung cancer. .15 .06
- B Only people who do not smoke die of lung cancer. .05 -.21
- C Smoking reduces chance of death from lung cancer. .57 .07
- D The less one smokes the greater the chance of dying from lung cancer. .20 .00

Source: Item 28 Science PSLE 1990

Four farmers planted their crops for four years in the following way.

	Farmer A	Farmer B	Farmer C	Farmer D
Year 1	beans	sorghum	potatoes	maize
Year 2	maize	potatoes	maize	sorghum
Year 3	sorghum	maize	beans	maize
Year 4	beans	potatoes	melons	sorghum

5. Which of the four farmers **A**, **B**, **C**, and **D** had the best pattern for crop rotation?

- .18 -.10
- .08 -.12
- .49 .22
- .23 -.06

Source: Item 34 Science PSLE 1990

It will be realised that given the nature of our PSLE, an inordinate emphasis is placed on achievement norm-referenced testing. Part of the reason is its convenience for selection, but frankly it is also easier to undertake. The utility of using such tests for selection is diminishing over time as access to the next level is expanding.

Data Capture and Processing

Achievement scores are captured through machine scorable sheets. The sheets are scanned and item responses recorded on to magnetic types at the Examinations, Research and Testing Division (ERTD). Programmes for merging student name files and test scores,

checking inconsistencies and missing data are run by the Government Computer Bureau (GCB). The ERTD does error checking and editing of the merged files.

The raw scores for each candidate are standardized to T-scores. The standardization formula is as follows:

$$10\left(\frac{x - \bar{x}}{SD}\right) + 50$$

Where x = subject core
 \bar{x} = subject mean
 SD = subject standard deviation
 10 = given standard deviation
 50 = given mean

The transformed subject scores are graded into A, B, C, and D. Sample:

Student 001									
	Sets Essay	Sets Obj. T.	Eng Essay	Eng 1	Eng 2	Maths 1	Maths 2	Soc Stu	Science
Row Scores	25	39	26	40	43	40	36	32	37
T - scores	58	47	60	58	57	63	60	53	55

Student 002									
	Sets Essay	Sets Obj. T.	Eng Essay	Eng 1	Eng 2	Maths 1	Maths 2	Soc Stu	Science
Raw Scores	24	33	25	33	33	22	26	18	24
T - scores	56	50	58	51	48	44	46	38	41

The transformed scores are then added together and averaged to obtain an aggregate which is graded into A, B, C, and D.

Sample:

Student A				
	T-Scores	Grades	Aggregate Score	57.76
Maths 1	63	A	Pass Level	B
Maths 2	60	B		
Science	55	B		
Soc Stu	53	C		
Eng 1	59	B		
Eng 2	57	B		
Sets	58	B		

Grading

There are set cut off points used for grading both subject test scores and aggregate scores.

Subject Grading

Grade	Standard Score
A	63 - up
B	55-62
C	46-54
D	45 - down

Aggregate Grading

Grade	Standard Score	SD Range	Approx. % of Candidates
A	63.01 - up	+ 1.00 SD & over	8
B	55.01 - 63.00	+ 0.5 SD - 1.00 SD	24
C	46.01 - 55.00	- 0.5 SD - + 0.5 SD	42
D	46.00 - down	- 1.5 SD & below	26

It is the aggregate score that is used in the merit list which in turn is used for selection where and when applicable.

Reporting

Various reports are produced by the Government Computer Bureau for the Examinations, Research and Testing Division. These are procedural reports some of which are used internally and the rest for public consumption. The internal reports are the Raw Scores, the Transformed Scores and Item Analyses.

Sample: Item Analysis

Question	Answer	A	B	C	D	None	Multi
		.04	.73	.20	.01	.00	.00
001	B	-.11	.36	-.29	-.09	.00	.00
		.14	.72	.07	.06	.00	.00
002	B	-.15	.34	-.19	-.19	-.01	.00
		.10	.19	.05	.64	.00	.00
003	D	-.10	-.29	-.14	.39	.00	.00

The Examinations, Research and Testing Division also receives a merit list which is used mainly for selection purposes by the Secondary Education Department

Sample:

Merit List

Pass level	Aggr Score	Sets	Eng 1	Eng 2	Maths 1	Maths 2	Soc Stu	Science
A	79.30	0	74	71	82	89	81	79
A	78.45	78	76	71	83	83	79	80
A	78.07	0	78	72	81	82	79	78
A	77.73	0	75	72	82	84	80	74

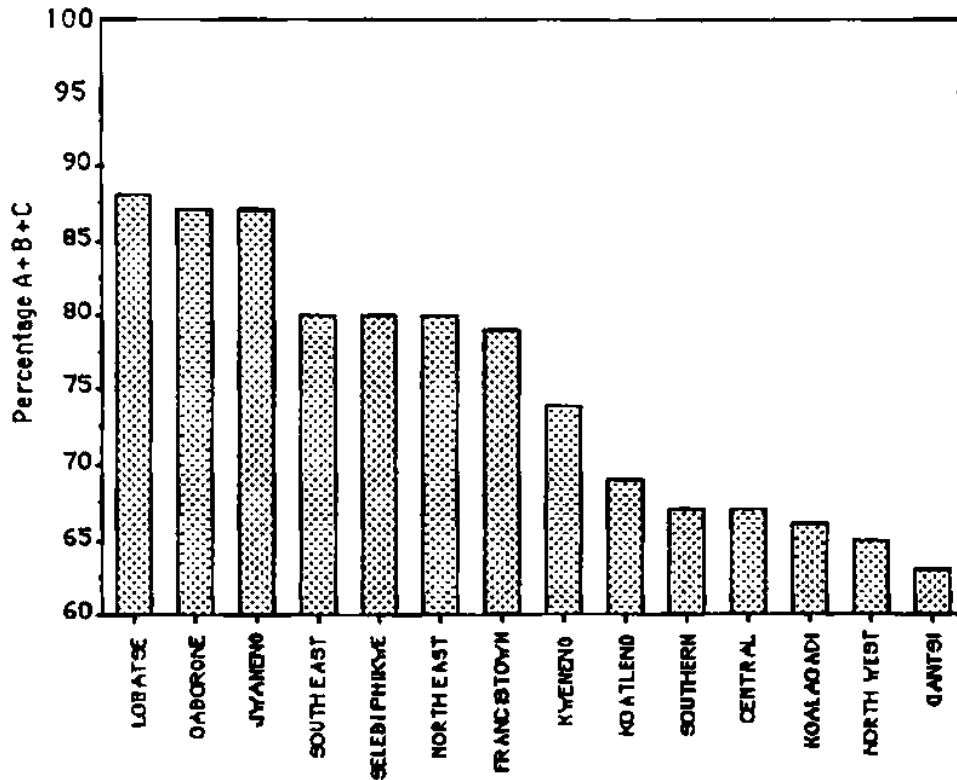
All government departments, schools, primary education officers and parastatals receive the overall results document which shows subject grades (A, B, C, and D), aggregate pass levels (A, B, C, and D) and various summaries. The results are shown by centre. At the end of each centre's results are summaries for the centre. The document also contains national summaries showing the overall number of candidates per district, the breakdown per grade level and the percentage of candidates in each grade A, B, C, or D. These summaries can be used to tell how districts perform against others.

Sample:

Actual Results

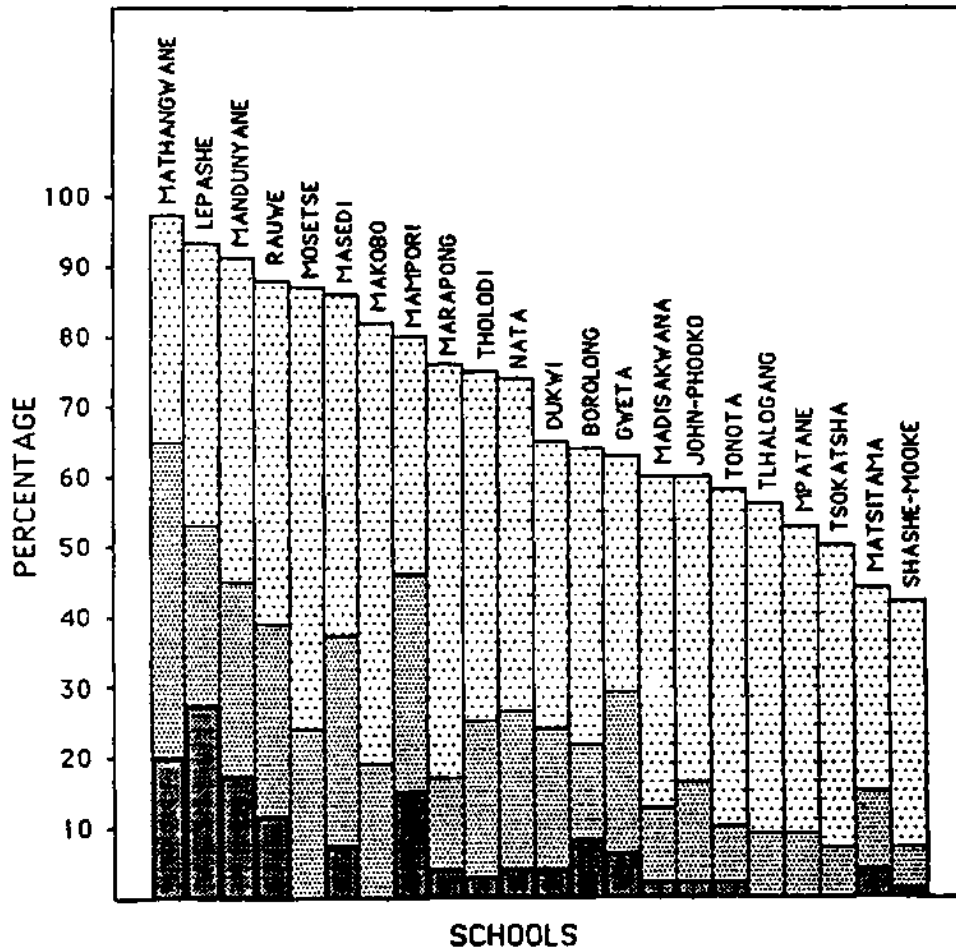
Pass level	Sets	Eng 1	Eng 2	Maths 1	Maths 2	Soc Stu	Science
B	c	B	A	A	A	A	A
A	B	A	A	A	B	A	A
C	C	C	C	B	C	B	C
c	c	B	C	C	C	C	D
B	A	B	B	B	B	A	B

Members of Parliament too can receive reports on request for their political districts. Most leaders have provided their constituencies with trophies as encouragement and so with the help of the reports they are able to tell how the different schools in their constituencies perform over time. The reports can be used to attempt to establish causality of success or the lack of it, hopefully followed by remedial action.



1991 PRIMARY SCHOOL LEAVING EXAMINATION PERCENTAGE A+B+C CATEGORIES BY DISTRICT - Sample

The Examinations, Research and Testing Division produces some reports for education officers only on request. An education officer would be in a position to provide services to schools based on their performance from year to year. For instance a school might require inservice training, more qualified teachers, more classrooms etc.



PROPORTIONS OF STUDENTS OBTAINING "A", "B" AND "C" PASSES ON THE 1991 PSLE: CENTRAL NORTH WEST REGION - Sample

References

1. Somerset, H.C.A. (1977) Selection, Examinations and Achievement in Botswana (A paper in Education for Kagisano, Volume 2 Annexes), Gaborone.
2. Republic of Botswana (1992) Criterion-Referenced Testing Rationale for Implementation. Department of Curriculum Development & Evaluation.

3.1.3. 1994 Primary School Leaving Examination/Science Paper

**REPUBLIC OF BOTSWANA
1994 PRIMARY SCHOOL LEAVING EXAMINATION**

SCIENCE

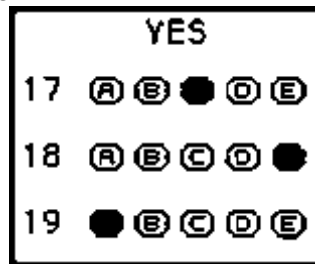
TIME: 60 MINUTES

Directions

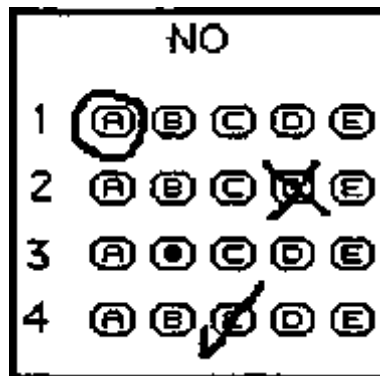
1. Use HB pencil ONLY. DO NOT use ink or ball point.
2. Print your name on the answer sheet in the space provided.
3. Fill the oval by BOY if you are a boy or GIRL if you are a girl.
4. In the four boxes under CENTRE write your centre number.
In the three boxes under STUDENT write your examination number. In the column of numbers below each box, fill the oval that has the same number that you entered in the box.
Fill the ovals with heavy black marks that fill the oval:

CENTRE				STUDENT		
5	1	0	7	2	3	9
0	0	●	0	0	0	0
1	●	1	1	1	1	1
2	2	2	2	●	2	2
3	3	3	3	3	●	3
4	4	4	4	4	4	4
●	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	●	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	●

- When you are told to begin, work as fast and as accurately as you can. If you cannot answer a question, do not spend too much time on it; go to the next question and come back to it later.
- You may do rough work on the test paper or on a sheet of blank paper. DO NOT use the answer sheet for rough work.
- Several possible answers are given for each question. Select the answer you think is the best and fill the oval for that answer on your answer sheet.
- Be sure to fill the ovals like this:



Erase completely answers that you wish to change.
 Do not make any stray marks on your answer sheet.
 If more than one oval is filled for a question it will be marked wrong.
 Be sure the oval you fill on your answer sheet is for the question you are working on in the test paper.
 DO NOT mark the ovals like this:



- If you do, your answers will be marked wrong.
- Sample questions are given to help you. Read them carefully before doing the questions.

Sample Questions

Sample 1 If a drum-skin is tightened its note will

- A. increase in pitch.
- B. decrease in pitch.
- C. sound louder.
- D. sound quieter.

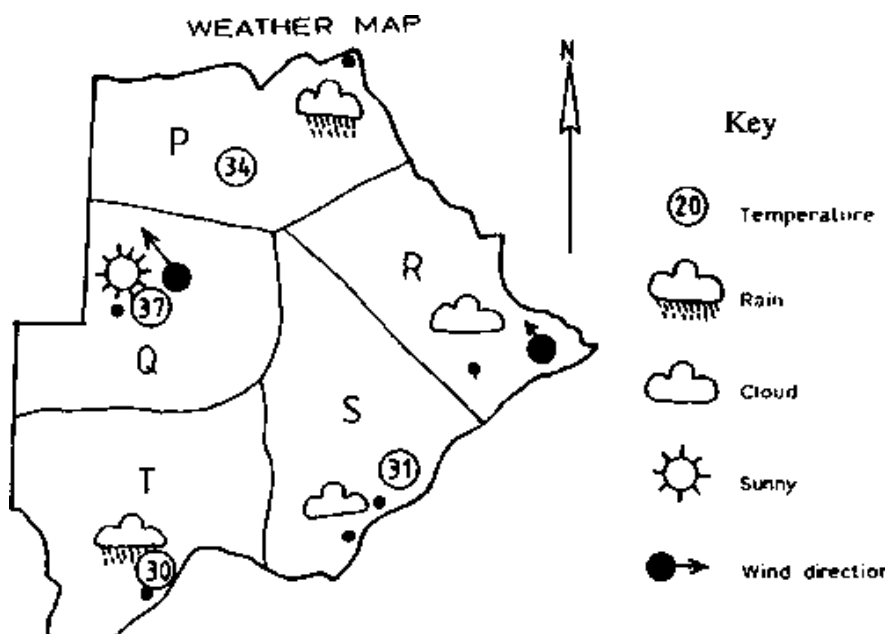
SAMPLE 1 ● B C D E

Sample 2 A man with a heavy cold finds his food tasteless because

- A. the cold germs kill the taste of the food.
- B. the cold germs numb the taste buds.
- C. his blocked nose cuts out his sense of smell.
- D. he has lost his appetite.

SAMPLE 2 A B ● D E

A group of Standard 7 pupils recorded what the weather had been like in regions P, Q, R, S and T on the map shown below. Use the information to answer questions 1 to 3.



1. In which of the following regions was it raining?

- A P and Q
- B R and S
- C P and T
- D S and T

2. In which direction was the wind blowing in regions Q and R?

- A North-west
- B South-east
- C North east
- D South-west

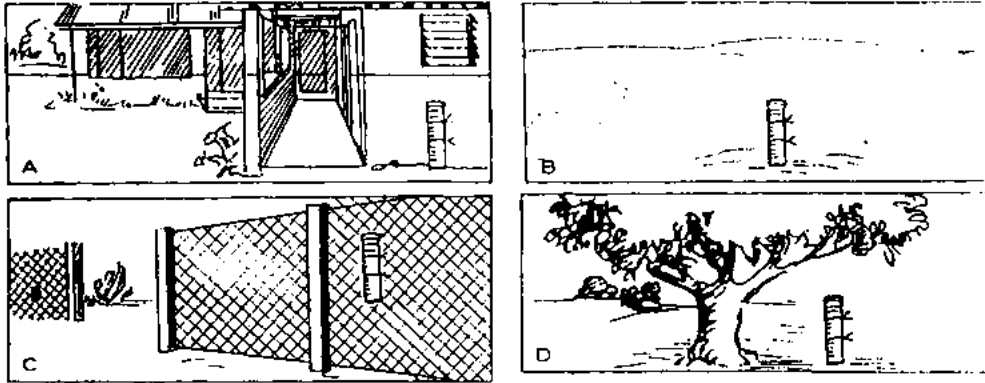
3. What was the weather like in region Q?

- A Sunny and cloudy
- B Sunny and windy
- C Cloudy and windy
- D Cloudy and hot

4. An anemometer is used to measure

- A amount of rainfall.
- B speed of wind.
- C atmospheric pressure.
- D temperature.

5. In which of the following diagrams is the rain gauge **correctly** placed?



6. Which of the following is a source of underground water?

- A River
- B Lake
- C Dam
- D Borehole

7. Evaporation takes place when

- A steam turns to water.
- B water turns to steam.
- C water turns to ice.
- D ice turns to steam.

8. Which water will a farmer who ploughs be most interested in when it rains?

- A Water that runs off the surface of the soil.
- B Water that is held around the soil particles.
- C Water that runs off to the sea.
- D Water that evaporates into the atmosphere.

Mpho heated some water in a container and recorded the temperature every two minutes as shown below. Heating was stopped after 28 minutes. Use the table to answer questions 9 to 11.

TIME (minutes)	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28
TEMPERATURE (°C)	10	12	16	24	30	38	44	50	58	64	72	80	96	96	96

9. How long did it take for the water to heat up to 60 °C?

- A 16 minutes
- B Between 16 and 18 minutes
- C Between 18 and 20 minutes
- D 18 minutes

10. What was the temperature of the water at the beginning and end of heating?

	Starting temperature	End temperature
A	0 °C	96 °C
B	10 °C	86 °C
C	0 °C	100 °C
D	10 °C	96 °C

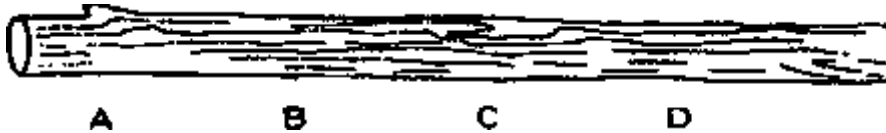
11. Which of the following reasons best explains why the temperature remained 96 °C between the 24th and 28th minute?

- A The burner was not hot enough.
- B The water had reached boiling point.
- C All the water had evaporated.
- D The thermometer was not working.

12. Which of the following organs is used to sense light?

- A Skin
- B Ear
- C Eye
- D Tongue

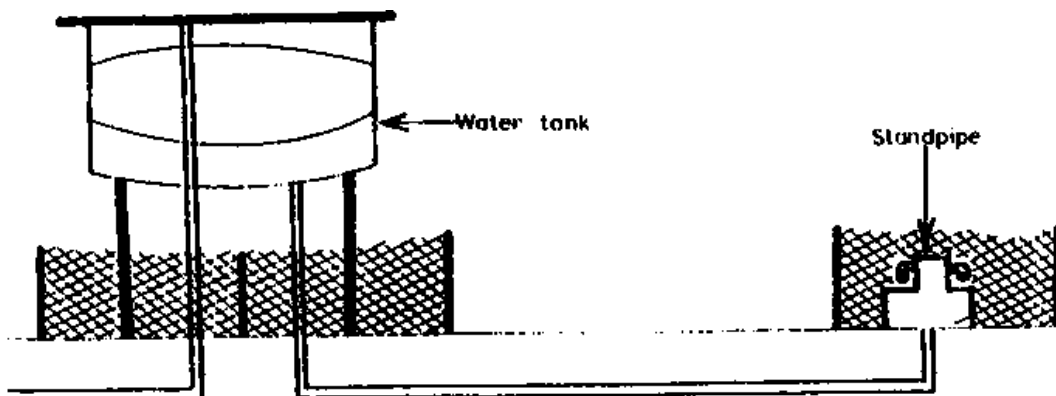
13. At which point in the diagram below would the stick break easily?



14. Which of the following activities **will help** in conserving soil?

- A Burning wood
- B Building houses
- C Keeping many animals
- D Digging terraces

The diagram shows a water system in a village. Use it to answer questions 15 and 16.



15. The water tank is covered to prevent

- A the water from being contaminated.
- B the water from evaporating.
- C people from misusing the water.
- D cattle from drinking the water

16. The water in the tank is purified by

- A distillation.
- B filtration.
- C chlorination.
- D sedimentation.

17. Wheelbarrows, scissors, hammers and spades are all examples of

- A gears.
- B inclined planes.
- C pulleys
- D levers.

Study the table below and answer questions 18, 19 and 20.

VERTEBRATE	COVERING OF THE BODY	TYPES OF LIMBS	REPRODUCTION	BODY TEMPERATURE
P	hair	arms and legs or four legs	young are born alive feed on milk	warm blooded
Q	feathers	wings and legs	eggs with hard shell	warm blooded
R	scales	legs	eggs, with leathery shell	cold blooded
S	damp skin	legs with webbed feet	eggs laid in water	cold blooded
T	thin scales	fins	eggs laid in water	cold blooded

18. Which of the following vertebrate groups have bodies covered with scales?

- A P and R
- B S and T
- C R and T
- D P and Q

19. Which of the following vertebrates are represented by the characteristics at P?

- A Amphibians
- B Reptiles
- C Birds
- D Mammals

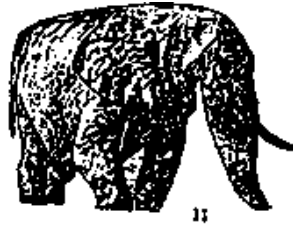
20. A frog is an example of a vertebrate represented by

- A T.
- B S.
- C R.
- D P.

21. When a substance is attracted to a magnet, it is said to be

- A an insulator.
- B magnetic.
- C a conductor.
- D non-magnetic.

Study the pictures of animals shown below, and answer question 22.



22. Which pair of animals shown below feeds on plants?

- A III and II
- B I and III
- C IV and II
- D I and II

23. Which of the following can be added to the soil to increase nutrients needed for plant growth?

- A Manure
- B Plastic
- C Sand
- D Water

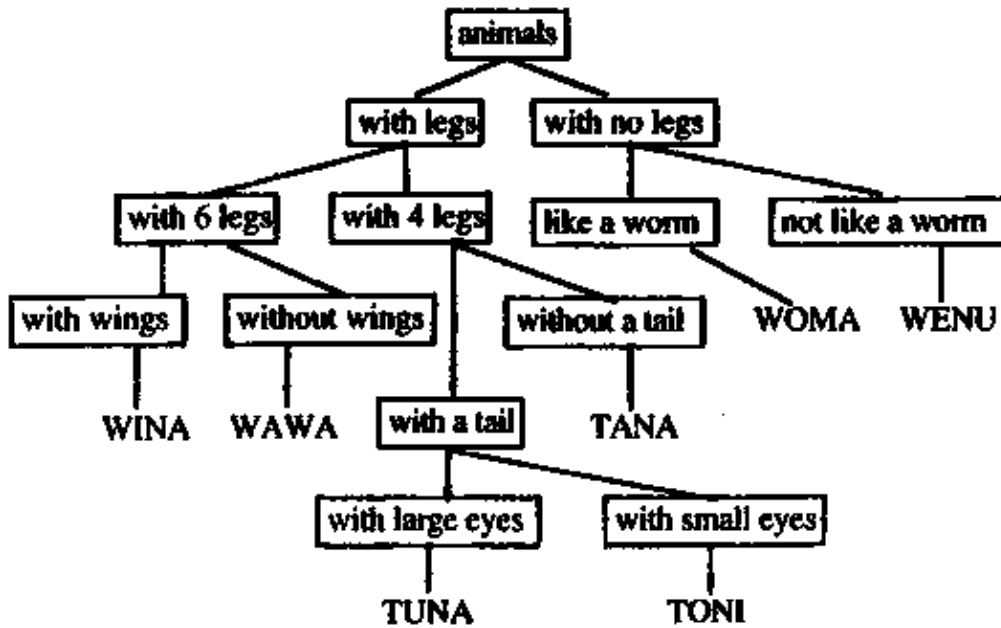
The diagram below shows parts of a plant. Use it to answer question 24.



24. The name of the part labelled I is

- A leaf.
- B fruit.
- C flower.
- D stem.

A class of pupils observed some animals in their environment. They classified them and invented names for them as shown below. Use it to answer questions 25 and 26.



25. What is the name of animal X?

- A TANA
- B WAWA
- C TUNA
- D WINA

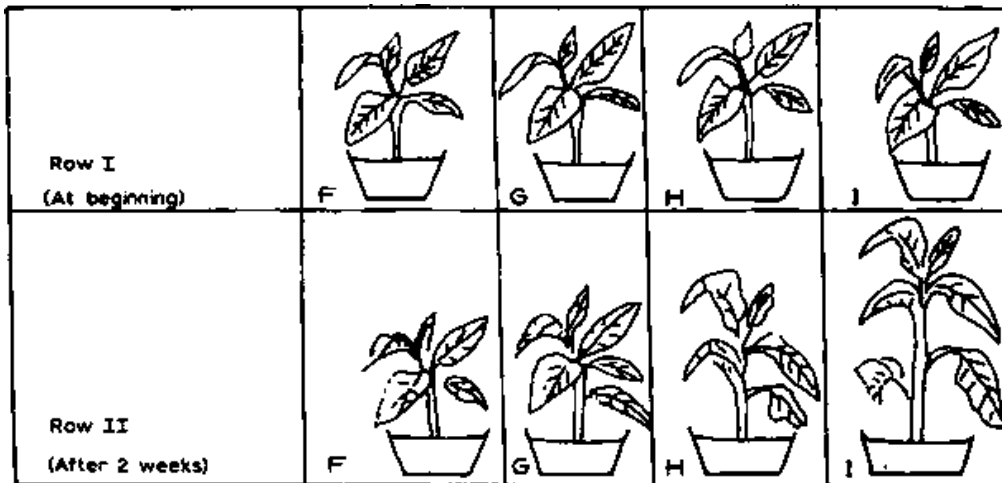
26. What is the name of animal Y?

- A WAWA
- B TANA
- C TUNA
- D WENU

27. Sound is heard when sound vibrations reach the

- A eyes.
- B nose.
- C skin.
- D ears.

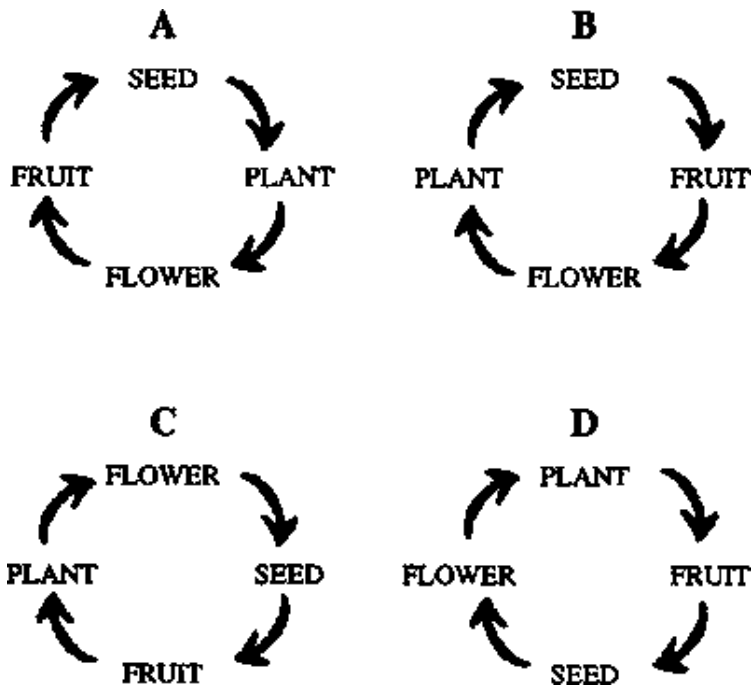
Bontle grew plants in four different types of soil. She gave the plants the same amount of water and exposed them to the same amount of sunlight. Row I shows the plants at the beginning of the experiment and Row II shows the same plants after two weeks.



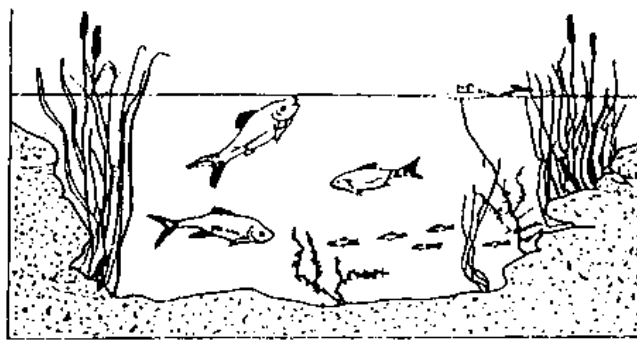
28. Which of the plants is likely to have been grown in loam soil?

- A F
- B G
- C H
- D I

29. Which of these shows the correct order of the life-cycle of a flowering plant?



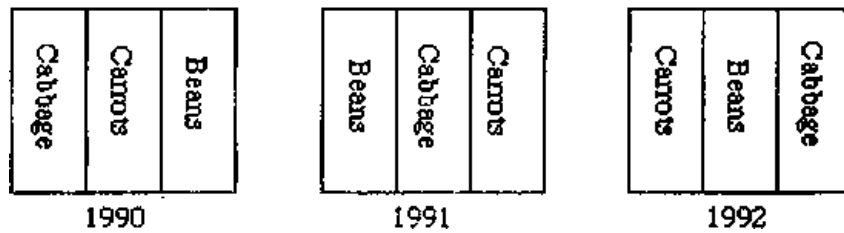
The diagram below shows an aquarium.



30. The water weed produces its own food. What is needed for this to take place?

- A Movement
- B Heat
- C Sunlight
- D Sound

31. The diagrams below show how plants were grown in a field for three years on the same plot.



What farming practice is most likely to have been carried out?

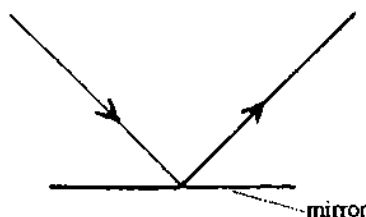
- A Row planting
- B Broadcasting
- C Fallowing
- D Crop rotation

32. Soil erosion can be prevented by

- A ploughing down the slope.
- B cutting down of trees.
- C over stocking.
- D ploughing across the slope.

33. What happens to light as it shines on the mirror as shown in the diagram below?

- A It is reflected.
- B It is refracted.
- C It is absorbed.
- D It is emitted.



The table below shows temperatures recorded in the morning and at midday for houses P, Q, R and S roofed with different material.

House	Temperature in the morning	Temperature at midday
P with iron roof	15 °C	37 °C
Q with clay tiles roof	18 °C	28 °C
R with grass roof	20 °C	27 °C
S with asbestos roof	18 °C	34 °C

34. Which house shows the greatest rise in temperature?

- A P
- B Q
- C R
- D S

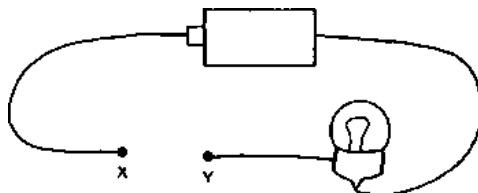
35. Which one of these instruments uses a string to produce sound?

- A A guitar
- B A drum
- C A trumpet
- D A flute

36. What would happen when the north pole of a magnet is brought near the north pole of a suspended magnet?

- A They will attract.
- B They will repel.
- C Suspended magnet will lie in N-S direction.
- D Suspended magnet will be demagnetised.

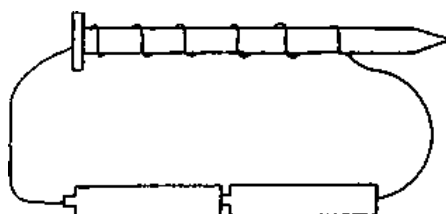
Dineo set an experiment shown in the diagram below to find substances through which electricity flows.



37. Which pair of substances would make the bulb light when they are connected between X and Y?

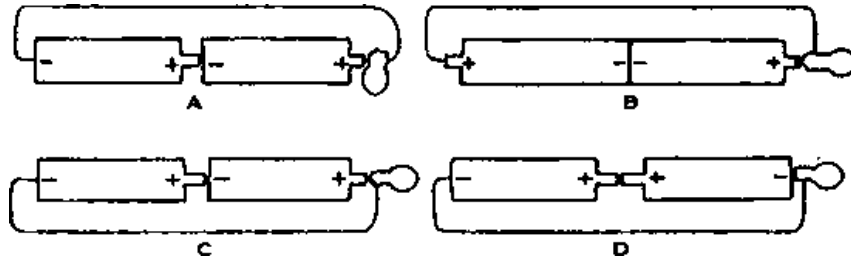
- A Wood and paper
- B Rubber and aluminium
- C Glass and Plastic
- D Iron and copper

38. What would happen when the number of coils is increased in the electromagnet shown below?



- A The electromagnet would become weak.
- B The nail would lose its magnetism.
- C The electromagnet would become strong.
- D The strength of the electromagnet would remain the same.

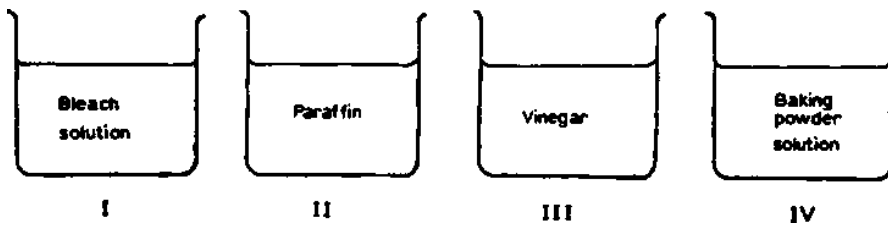
39. Which of the following connections would make the bulb light?



40. Which of these diseases is caused by lack of cleanliness?

- A Scabies
- B Syphilis
- C Measles
- D Malaria

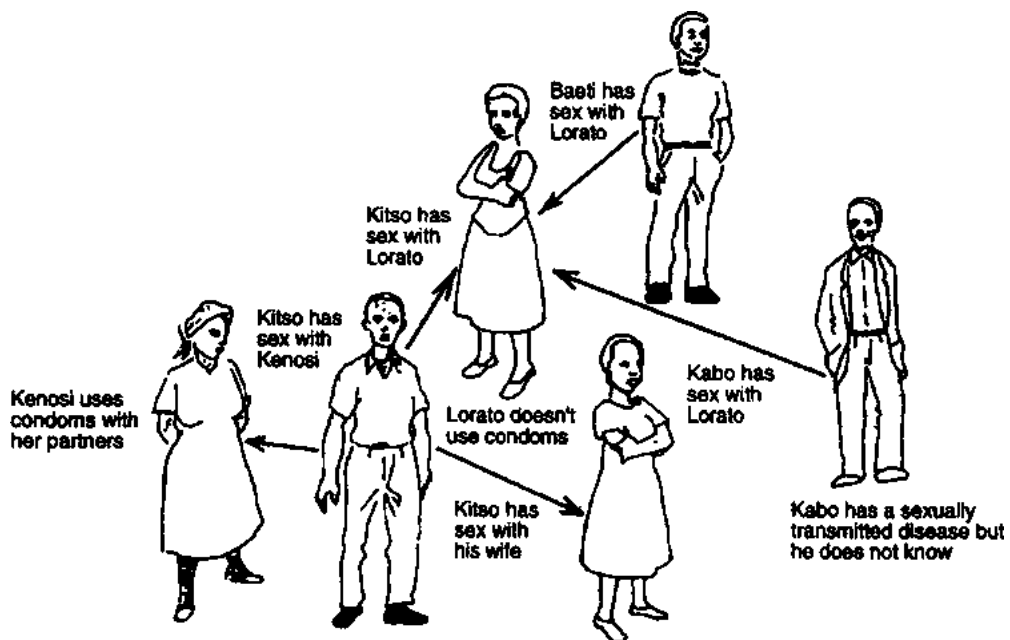
41. Which of the chemicals shown below are dangerous when swallowed?



- A II and IV
- B III and IV
- C I and III
- D I and II

42. Who is most likely to be free from a sexually transmitted disease?

- A
- B
- C
- D



43. Which of the following foods would make a balanced meal?

- A Porridge, meat and cabbage
- B Samp, bread and porridge
- C Meat, eggs, and fish
- D Spinach, pumpkin and cabbage

44. Which of the following changes takes place in a boy at puberty?

- A He becomes fat.
- B His voice deepens.
- C His hips grow larger and round.
- D He grows hairs in the ears.

The table below shows the causes of death from accidents in the home in one country. Use it to answer questions 45 and 46.

Cause of Death	Age group in years					TOTAL
	0-4	5-14	15-64	65-74	75+	
Falls	21	6	334	359	2092	2812
Poisoning	10	8	398	53	56	525
Burns	57	26	192	94	270	639
Drowning	20	3	21	12	17	73
TOTAL	108	43	945	518	2445	4049

45. What was the cause of most deaths?

- A Burns
- B Poisoning
- C Falls
- D Drowning

46. What age group had most accidents?

- A 0-4 years
- B 15-64 years
- C 65-74 years
- D 75+ years

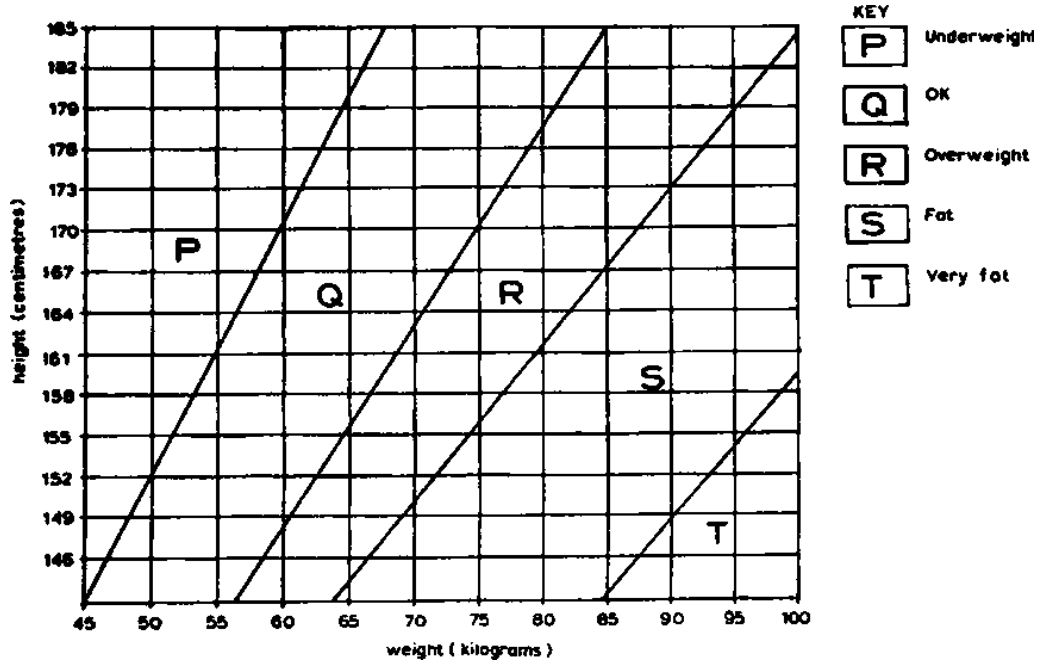
47. Which of the following methods of birth control can help to prevent pregnancy and spread of sexually transmitted diseases?

- A Using birth control pills
- B Using a loop
- C Using a cream that kills sperms
- D Using condoms

48. Which of the following drugs helps people to get well?

- A Vaccine
- B Alcohol
- C Tobacco
- D Medicine

The chart below is used to see if one is overweight, underweight or just the right weight. Use it to answer questions 49 and 50.



49. A person weighs 80 kilograms and is 176 centimetres tall. In which group is this person in?

- A P
- B Q
- C R
- D S

50. In which group is a person most likely NOT eating enough?

- A P
- B R
- C S
- D T

51. Smoking in young people may

- A slow the growth of the body.
- B make them grow taller.
- C make them grow fat.
- D deform their bones.

The diagram below shows some groups of foods.

W Carrots Spinach Tomatoes Oranges	X Sugar Potatoes Bread Rice
Y Eggs Beef Beans Chicken	Z Cheese Butter Groundnuts Margarine

52. Which foods would you eat for energy?

- A W and X
- B W and Y
- C Z and X
- D Z and Y

53. Which one of the following is part of the digestive system?

- A Lungs
- B Kidney
- C Heart
- D Small intestine

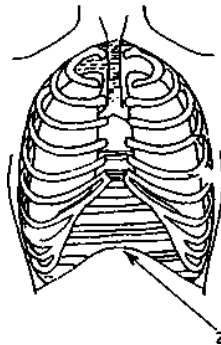
54. Which one of the following statements about smoking is NOT true?

- A It is good for pregnant women.
- B People who smoke cannot stop it easily.
- C Smoking increases the chances of getting lung cancer.
- D Smoking increases the risks of heart attack.

55. Which is the correct statement about the diseases cholera, typhoid and bilharzia?

- A They can be prevented by vaccinating in children.
- B People suffering from these usually get well after a few weeks.
- C They are caused by lack of cleanliness of the body.
- D Organisms causing them are spread by water with human waste.

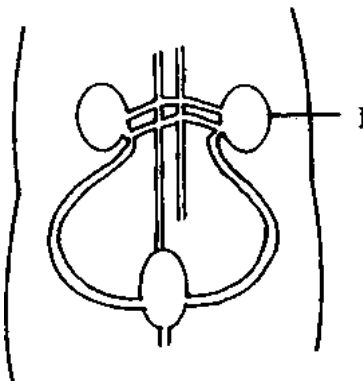
The diagram below shows parts of the breathing system.



56. The part labelled Z is the

- A lung.
- B rib.
- C diaphragm.
- D wind-pipe.

Study the diagram of the system shown below.



57. The part labelled I is the

- A bladder.
- B heart.
- C kidney.
- D ovary.

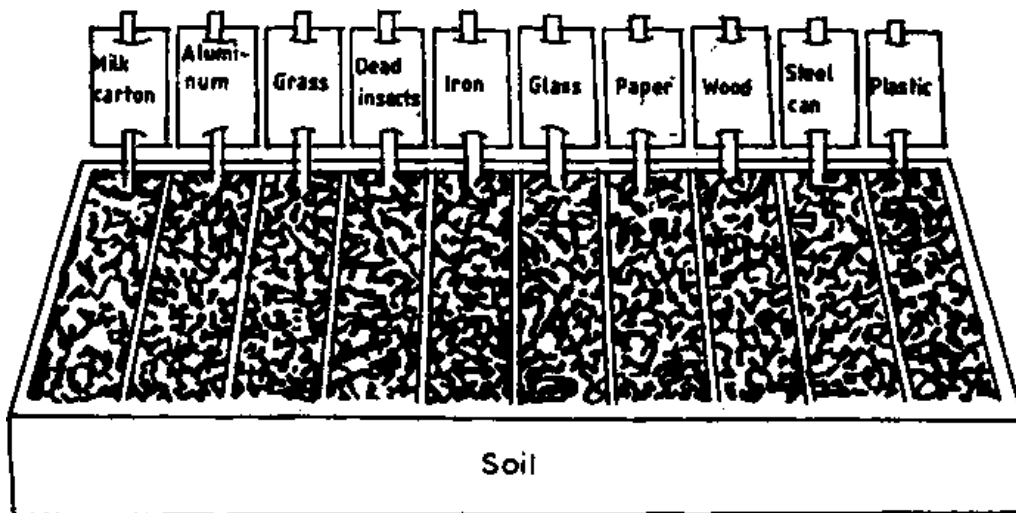
58. Stagnant water must not be kept near homes because organisms which spread _____ may breed in it.

- A tuberculosis
- B measles
- C malaria
- D scabies

59. Who is responsible for proper disposal of waste in towns and villages?

- A Health Inspector
- B Family Welfare Educator
- C Police Officer
- D Medical Officer

A group of students set an experiment shown in the diagram below. Each material shown on the labels was buried in the soil.



60. Which of the materials are going to be decomposed?

- A Aluminium can, dead insects, wood, iron
- B Paper, plastic, iron, steel can
- C Grass, plastic, milk carton, aluminium can
- D Grass, dead insects, paper and wood

3.1.4. 1993 Primary School Leaving Examination/Science Paper

REPUBLIC OF BOTSWANA
1993 PRIMARY SCHOOL LEAVING EXAMINATION

SCIENCE

TIME: 60 MINUTES

Directions

1. Use HB pencil ONLY. DO NOT use ink or ball point.
2. Print your name on the answer sheet in the space provided.
3. Fill the oval by BOY if you are a boy or GIRL if you are a girl.
4. In the four boxes under CENTRE write your centre number.
In the three boxes under STUDENT write your examination number. In the column of numbers below each box, fill the oval that has the same number that you entered in the box. Fill the ovals with heavy black marks that fill the oval:

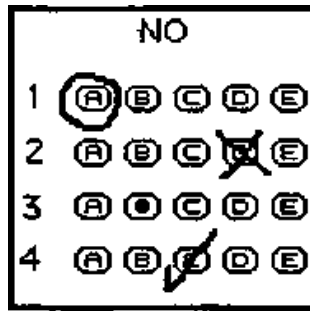
CENTRE				STUDENT		
5	1	0	7	2	3	9
0	0	●	0	0	0	0
1	●	1	1	1	1	1
2	2	2	2	●	2	2
3	3	3	3	3	●	3
4	4	4	4	4	4	4
●	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	●	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	●

5. When you are told to begin, work as fast and as accurately as you can. If you cannot answer a question, do not spend too much time on it; go to the next question and come back to it later.
6. You may do rough work on the test paper or on a sheet of blank paper. DO NOT use the answer sheet for rough work.
7. Several possible answers are given for each question. Select the answer you think is the best and fill the oval for that answer on your answer sheet.
8. Be sure to fill the ovals like this:

YES					
17	(A)	(B)	●	(D)	(E)
18	(A)	(B)	(C)	(D)	●
19	●	(B)	(C)	(D)	(E)

Erase completely answers that you wish to change.
Do not make any stray marks on your answer sheet.
If more than one oval is filled for a question it will be marked wrong.
Be sure the oval you fill on your answer sheet is for the question you are working on in the test paper.

DO NOT mark the ovals like this:



If you do, your answers will be marked wrong.

9. Sample questions are given to help you. Read them carefully before doing the questions.

Sample Questions

- Sample 1** If a drum-skin is tightened its note will
 A. increase in pitch.
 B. decrease in pitch.
 C. sound louder.
 D. sound quieter.

SAMPLE 1 ● B C D E

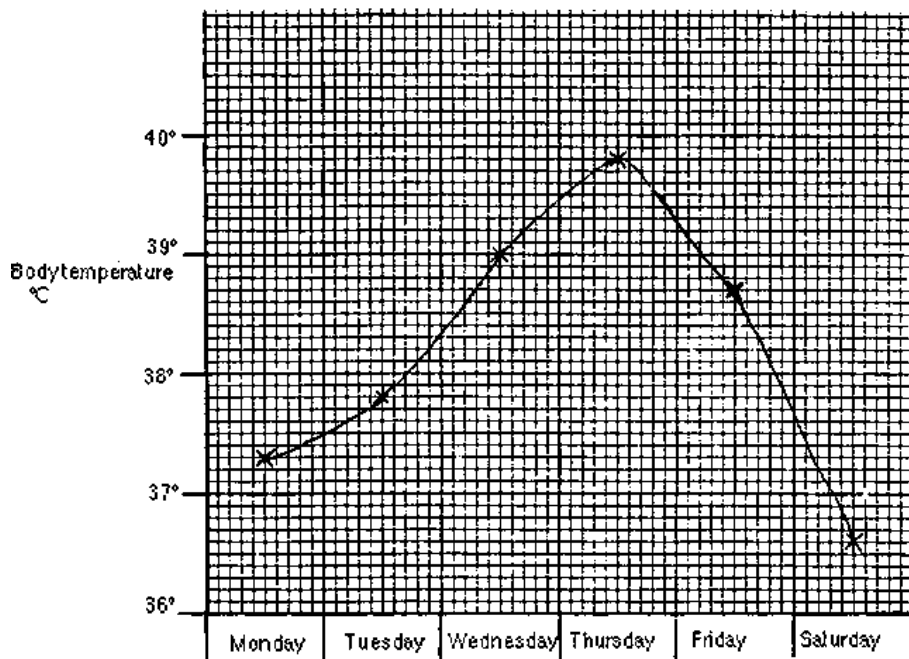
- Sample 2** A man with a heavy cold finds his food tasteless because
 A. the cold germs kill the taste of the food.
 B. the cold germs numb the taste buds.
 C. his blocked nose cuts out his sense of smell.
 D. he has lost his appetite.

SAMPLE 2 A B ● C E

DO NOT TURN OVER THE PAGE UNTIL YOU ARE TOLD TO DO SO

Questions 1 and 2

Mpho was sick for a week. The graph below shows his body temperature recordings.



1. What was Mpho's temperature on Monday?
 - A 37,3 °C
 - B 37,5 °C
 - C 37,6 °C
 - D 38,7 °C

2. On what day was Mpho's temperature 36,6 °C?
 - A Monday
 - B Tuesday
 - C Thursday
 - D Saturday

3. What type of animal is a snake?
 - A A mammal
 - B An amphibian
 - C A reptile
 - D A fish

4. The best food for a baby is
 - A cow's milk.
 - B goat's milk.
 - C mother's milk.
 - D milk powder.

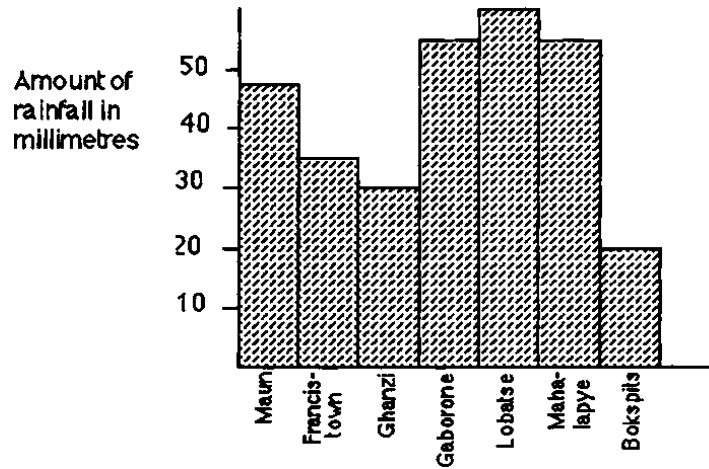
5. Which of these will melt when heated?
 - A Paper
 - B Cotton
 - C Leather
 - D Plastic

6. To which part of a plant are insects mostly attracted?
 - A Flower
 - B Leaf
 - C Stem
 - D Root

7. Plants kept in the dark become thin and yellowish because they lack
 - A air.
 - B sunlight.
 - C manure.
 - D water.

Questions 8 and 9

The graph below shows rainfall recordings for some places in Botswana for a day in January.



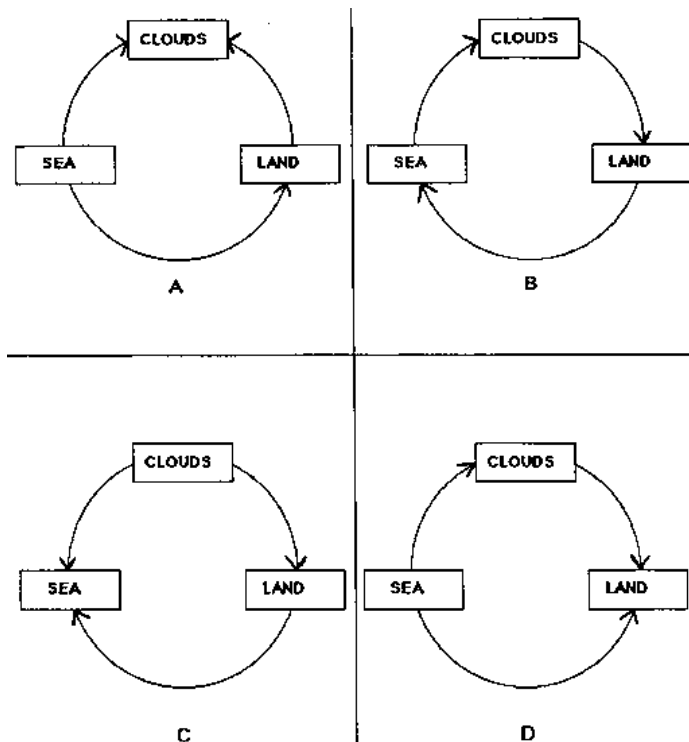
8. The place with the least amount of rainfall recorded is

- A Lobatse.
- B Ghanzi.
- C Bokspits.
- D Francistown.

9. Which place had more rain than Gaborone?

- A Francistown
- B Maun
- C Mahalapye
- D Lobatse

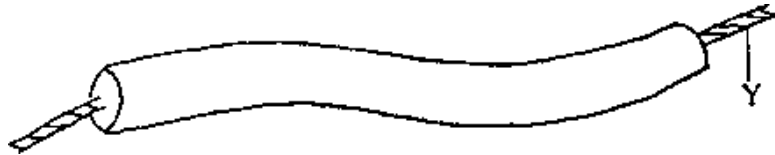
10. Select the diagram that correctly shows the water cycle.



11. Which of the following types of soil is the most fertile?

- A Clay
- B Sand
- C Loam
- D Gravel

12. The picture below shows part of a wire to be connected to the "live" pin of an electric three-pin plug.



Which of the following materials can be used to make part Y?

- A Rubber
- B Plastic
- C Copper
- D Wood

13. Which organ pumps blood to all parts of the body?

- A Brain
- B Kidney
- C Liver
- D Heart

14. The largest cause of death among smokers is

- A heart attack.
- B tuberculosis.
- C lung cancer.
- D cancer of the liver.

15. What are infectious diseases? They are diseases which

- A can easily be passed on from person to person.
- B are caused by a shortage of a particular food.
- C cannot be cured.
- D only infect young people.

16. The following diagram shows part of a human skeleton.



Which of the following is a function of this part? It protects the

- A heart.
- B brain.
- C heart and lungs.
- D brain and lungs.

17. The most likely way to get a sexually transmitted disease is by

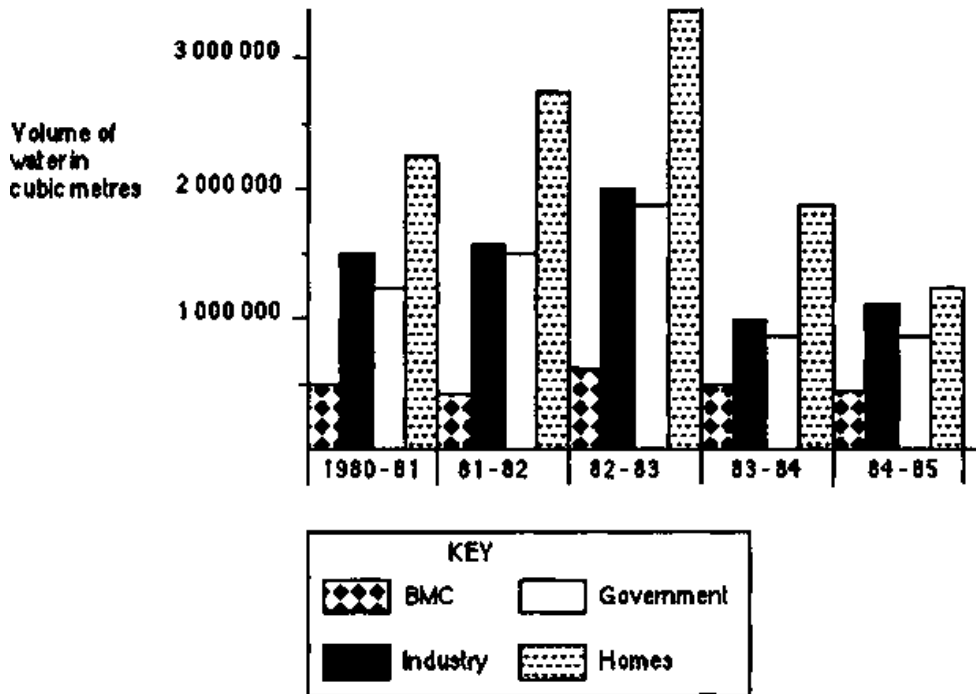
- A sharing toilets used by infected people.
- B kissing or touching another person.
- C having sexual intercourse with an infected person.
- D sharing cups and plates with other people.

18. Which of the following objects **changes movement** energy to **sound energy**?

- A Lamp
- B Battery
- C Guitar
- D Match stick

Questions 19 and 20

The graph below shows the volume of water used in Botswana from 1980 to 1985.



19. The largest use of water during 1984-85 was in

- A BMC.
- B industry.
- C government.
- D homes.

20. How much water was used at BMC in 1980-81?

- A 500 000 m³
- B 1 000 000 m³
- C 1 500 000 m³
- D 2 250 000 m³

21. Select the diagram that represents a battery.



22. The season that has longer nights and shorter days is

- A summer.
- B autumn.
- C winter.
- D spring.

Questions 23 to 27

Choose diseases from the list below to answer questions 23 to 27.

- A Bilharzia
- B Malaria
- C Scabies
- D Diarrhoea

23. For which of the diseases above should patients be given an oral rehydration drink?

24. Which of the diseases above is caused by a blood fluke?

25. Which of the diseases above is the commonest among children under 5 years in Botswana?

26. Which of the diseases above is spread by mosquitoes?

27. Which of the diseases can be prevented by regular washing of the body?

28. If the south pole of a magnet is brought near the north pole of another magnet, the two magnets will

- A remain at rest.
- B attract one another.
- C repel one another.
- D point in the north-south direction.

29. Which of the following substances will dissolve in water?

- A Chalk dust
- B Sand
- C Sugar
- D Bread flour

30. Which of the following parts of the body is the hardest?

- A Skin
- B Hair
- C Muscle
- D Bone

31. Which of the following does not make a healthy mother?
- A Having babies every year
 - B Spacing children
 - C Having fewer children
 - D Breast feeding her babies
32. What instrument is used to measure humidity?
- A Hygrometer
 - B Rain gauge
 - C Speedometer
 - D Anemometer
33. The purest form of natural water is
- A river water.
 - B pond water.
 - C well water.
 - D rain water
34. Which of the following are all agents of soil erosion?
- A Water, wind and animals
 - B Animals, plants and wind
 - C Wind, water and plants
 - D Animals, water and plants
35. The part of the human eye through which light passes to the inside is called the
- A iris.
 - B pupil.
 - C cornea.
 - D retina.
36. Which of the following forms of energy do we need to cook our food?
- A Electrical energy
 - B Heat energy
 - C Light energy
 - D Solar energy
37. Which of the following statements is true about plants?
- A All leaves have the same shape.
 - B Green plants can make their own food without sunlight.
 - C The stem holds fruits and flowers.
 - D The root holds plants firmly to the ground.
38. Which of the following statements best describes soil erosion?
- A It is the breaking down of rocks to form soil.
 - B It is the layers that make up the soil.
 - C It is the removal of mineral salts from the soil.
 - D It is the removal of topsoil.
39. Which of the following factors does not control the weather?
- A Pressure

- B Week day
- C Sun
- D Humidity

40. The most likely reason for having windows on two opposite sides of a room is to

- A make the house look beautiful.
- B allow people to escape if there is a fire.
- C allow movement of air for ventilation.
- D enable one window to be closed while the other is open.

41. In which of the following conditions will wet clothes dry fastest?

- A In moving, hot air
- B In moving, damp air
- C In still, hot air
- D In still, cool air

42. What source of energy does a solar heater use?

- A Moonlight
- B Sunlight
- C Electricity
- D Gas

43. Four groups of pupils A, B, C and D collected some small animals and classified them as follows:

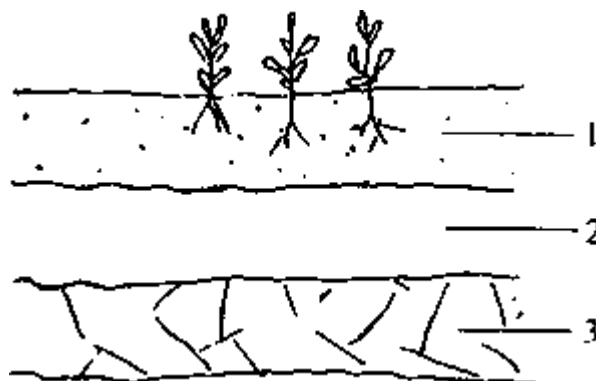
Group	Body parts	Jointed legs	Wings
A	3	6	1 or 2 pairs
B	2	6	1 pair
C	2	8	0
D	3	8	2 pairs

One of the animals collected was a spider. Which group could have collected the spider?

44. Maize, cooking oil, honey, sugar and butter are all good examples of

- A energy-giving foods.
- B foods dangerous to health.
- C protective foods.
- D body-building foods.

45. The diagram below shows a soil profile.



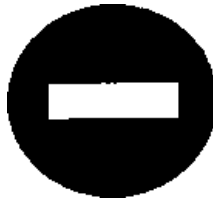
What is layer 3?

- A Topsoil
- B Subsoil
- C Parent rock
- D Sandy soil

46. Which of the following is used for preventing disease?

- A Nicotine
- B Aspirin
- C Alcohol
- D Vaccine

47. What does the road sign shown below mean?

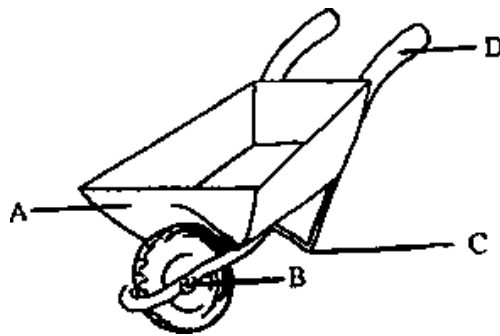


- A Road crossing with another.
- B For pedestrian crossing.
- C One-way road.
- D No entry.

48. In which direction does a compass needle point?

- A North
- B South
- C East
- D West

49. The diagram below shows a lever.



Which of the parts labelled A, B, C or D is the pivot?

50. What do plants get from humus?

- A Mineral salts
- B Chlorophyll
- C Oxygen
- D Water

51. Tebogo added water to soil in a tin. She observed bubbles coming out. This is because

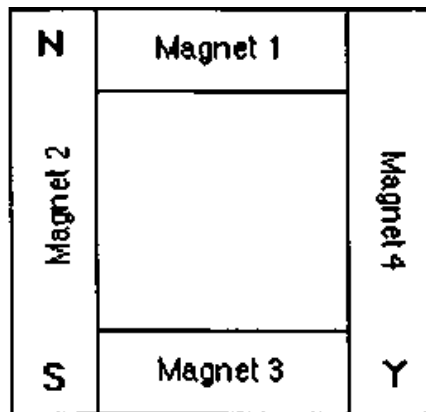
- A soil breathes air.

- B water has air.
- C soil has air.
- D bacteria in the soil produce air.

52. Which of the following statements about AIDS is false?

- A AIDS affects men, women and children.
- B A person with AIDS can look perfectly healthy.
- C AIDS is spread through shaking hands.
- D AIDS is caused by a virus.

53. Badiri wanted to make a square using four bar magnets as shown in the diagram below.

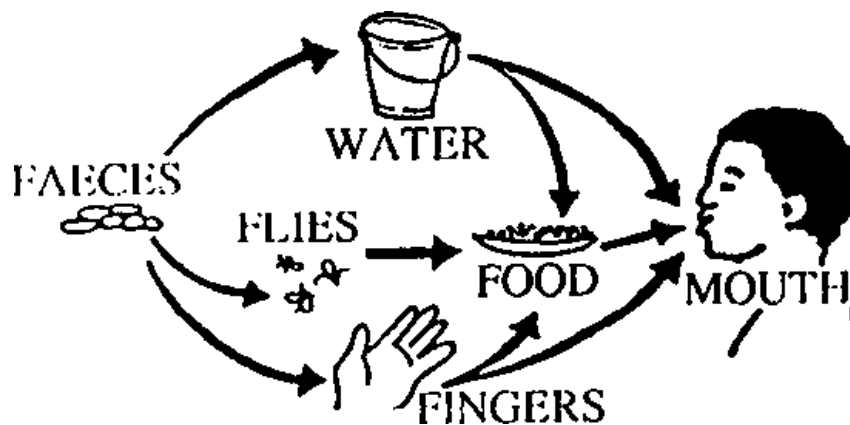


What should pole Y be for him to succeed?

- A North
- B South
- C West
- D Neutral

Questions 54 and 55

The diagram below shows how infections can be spread because of poor hygiene.



54. Which of the following paths of infection is NOT represented in the diagram?

- A Faeces ⇒ soil ⇒ food ⇒ mouth
- B Faeces ⇒ skin ⇒ mouth
- C Faeces ⇒ flies ⇒ food ⇒ mouth
- D Faeces ⇒ water ⇒ mouth

55. Which of the following diseases is likely to be spread by the water?

- A Polio
- B Measles
- C Cholera
- D Whooping cough

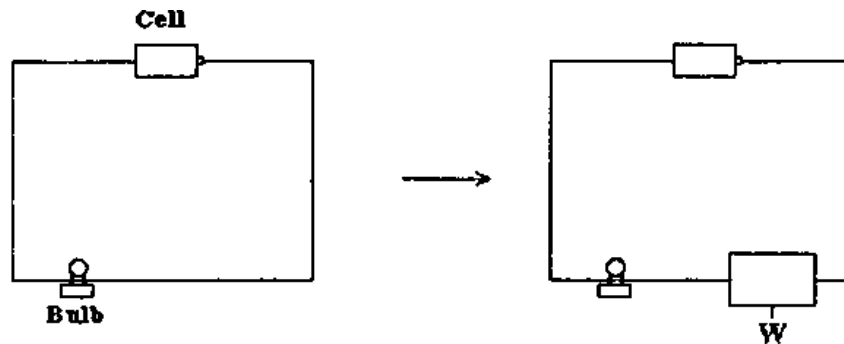
56. Which of the following is NOT looked after by the Council Health Services?

- A Planting vegetables
- B Food hygiene
- C Preventing spread of disease
- D Rubbish disposal

57. Which of the following will cause physical weathering of rocks?

- A Water, temperature change and oxygen
- B Water, wind and oxygen
- C Wind, temperature change and oxygen
- D Water, temperature change and wind

58. A student set up the following circuit and observed that the bulb lit normally. He connected a mystery box, W, to the circuit and observed that the bulb lit more brightly.



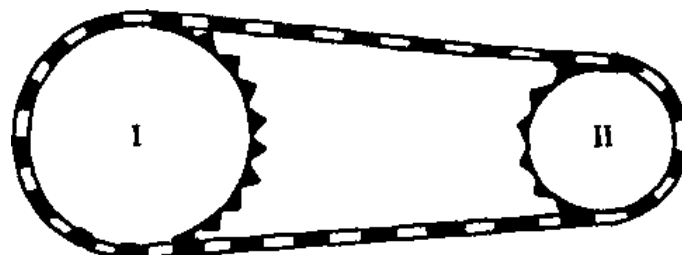
What does the mystery box contain?

- A another bulb
- B a piece of wire
- C another cell
- D a strip of plastic

59. How does heat travel from the sun to the earth?

- A Radiation
- B Reflection
- C Convection
- D Conduction

60. The diagram below shows toothed gear wheels connected by a chain.



If gear I is turned clockwise, gear II will turn

- A clockwise.
- B anticlockwise.
- C sideways.
- D upwards.

3.2. Kenya

3.2.1. Overview

End of Primary School Examination

1, Title of examination:	Kenya Certificate of Primary Education (KCPE)
2. Amount of fees charged:	≈ US\$ 4.5
3. Examination after years in primary school (6, 7, 8 years):	8 yrs
4. Children's entry age in primary school:	6 yrs
5. Number of pupils sitting examination in 1994:	395,765
6. Examination subjects offered:	14 subjects, 7 compulsory papers: <ul style="list-style-type: none">• English• Kiswahili• Mathematics• Science & Agriculture• Art & Craft, Music• Business Education & Home Economics• GHC (Geography, History, Civics), Religious Education (Christian or Islamic or Hindu)
7. Language of examination:	English (except for Kiswahili paper)
8. Institution setting the examination questions:	Kenya National Examinations Council
9. Have there been any reforms in the examination questions?	Yes
When? (year)	1985
What kind?	There was a shift from simple recall questions to higher-order questions.
10. Stages of development of examination questions (please describe):	<ul style="list-style-type: none">• Invitation of setters• Setting of questions• Pre-moderation of questions• Final moderation

- 11. Type of examination questions and distribution of different kind of questions.** All are multiple-choice questions with:
26% recall questions
33% comprehension
24% application
17% higher abilities
- 12. Is continuous assessment incorporated in the final examination?** Yes []
No [x]
- 13. Are examination items pretested?** Yes []
No [x]
The set KCPE papers are not pretested because of technical problems (inadequate time, costs involved, security).
- 14. Which professional groups are involved in setting the examination questions?**
 - Primary school teachers
 - Tutors of TTCs
 - Examination Officers
- 15. Are the same professionals who set the examination questions involved in marking papers?** Yes [x]
No []
- 16. How are examination results used for improving teaching in primary schools?** Primary school teachers change their teaching strategies to improve performance in examination.
- 17. To what other uses are the examination results put?**
 - Selection
 - Certification
- 18. Main problem with Primary School Leaving Examinations?** Assessment of practical skills

3.2.2. Writing of Test Items for the Primary School Leaving Examination in Kenya

by Philip M. Kitui, Kenya National Examinations Council

Background

The primary education course in Kenya takes eight years. The Kenya Certificate of Primary Education examination was administered for the first time in November 1985 by the Council to primary school leavers who had completed the first cycle of the 8.4.4. Education System. The examination consists of seven compulsory papers and tests each of the pupils in 14 subjects namely, English, Kiswahili, Mathematics, Science, Agriculture, History, Civics, Geography, Music, Craft, Home Science, Art, Business Education and either Christian Religious Education, Islamic Religious Education or Hindu Religious Education. Over the last years about 400,000 candidates took the examination annually.

Objectives of the KCPE Examination

The objectives of the KCPE examination are:

- 1)** To rank candidates according to their achievement in all the subjects offered in the examination. This ranking facilitates fair selection for further education.
- 2)** To award certificates to persons who have completed primary education. Every candidate who sits the KCPE examination is awarded a certificate in which his/her attainment in each of the subjects he/she sat is indicated by means of a letter grade and a standard score.

3) To generate data on candidates' performance that can be used in the evaluation of the curriculum and effectiveness of instruction in the primary schools. For the KCPE examination to facilitate a fair allocation of the limited opportunities for further education and training to over 400,000 candidates, it has to be objective. Thus it must satisfy the psychometric criteria for a good test, namely: validity, reliability and efficiency. Administration of the test should also be cost-effective. Hence the Kenya National Examinations Council uses objective items of the multiple-choice type for most of the papers. Each item has four options, one of which is the key. In addition to an objective paper, each of the two language subjects, English and Kiswahili, is tested by means of a composition.

For the practical subjects like Science, Agriculture and Home Science, questions testing practical skills are part of the written test.

However, there is a school-based practical assessment of these subjects and other subjects of the school curriculum conducted by the Ministry of Education for the purpose of awarding specially revamped primary school leaving certificates. School-based assessment was started in 1984 as a Government policy. This approach is superior and has the support of modern thinking on certification. The modern approach is dichotomous, the examination certificate being supported by a profile from the school. In our case, the school leaving certificate is a basis for this approach and needs to be strengthened.

The KCPE examination papers for each subject are based on national syllabi developed by the Kenya Institute of Education. These, syllabi specify both the objectives of the learning activities and the content and skills to be learned. In so doing, they set the levels of competence expected of a learner who completes the course in any subject.

Development of the KCPE Examination Papers

For each of the subjects it examines, the Kenya National Examinations Council has employed a tests and measurement specialist who is also an expert in the subject. This person not only plans the work and schedules necessary for the development of tests but also provides guidance in the area of tests and measurements to contracted professional people appointed by the Council to perform the functions of setters and moderators. The development of a test paper for the KCPE examination is carried out through the following stages:

Stage 1: The Council identifies and appoints six professional educators as setters for the paper. For each subject, persons identified must

- (1) have had practical experience in either teaching at the primary school level or in the development of the primary school curriculum for the subject;
- (2) be trained teachers who are competent in the subject;
- (3) be men and women of proven integrity;
- (4) be conversant with the technicalities of writing multiple-choice test items;
- (5) not be preparing candidates for the KCPE examination.

Stage 2: The subject specialist and the setters prepare a table of specifications for the test. The specifications are the blueprint for the test. They show the syllabus content and cognitive skills to be tested, the number of questions for each type of content and cognitive skill. Drawing up this table enables the setters to identify a representative sample of content for the test as well as spread the skills to be tested so that the test as a whole can discriminate effectively between candidates of different levels of achievement.

Stage 3: The setters divide up the work of writing test items on various units of content and skills. The council tests and measurement specialist goes over the expected qualities of test items and reminds the setters of the precautions they must take to safeguard security of the

drafts they will work on. In the course of writing items, the setters meet to discuss the items they have come up with. During the discussions poor items are discarded and shredded while advice is given on items that must be improved upon. In the end, the setters put together a draft question paper which they submit to the Council through the tests and measurement specialist. The draft is then kept in a secure place to await moderation.

Stage 4: Moderation of the draft test items is done by a group of 10 experts. They include the six setters and four other experts identified on the basis of the criteria used for identifying the setters. The moderation meeting is chaired by a senior tests and measurement specialist. It may take two to five full working days depending on the quality of items produced by the team of setters. During the period of moderation, some of the questions may be replaced while others will be re-worded.

Stage 5: The tests and measurement specialist, who is also secretary to the moderation committee for the subject, writes a neat draft of the paper and ensures that all the necessary diagrams, graphs and pictures are drawn in their final form and labelled correctly. The specialist proofreads the paper as it is typeset and printed and advises on necessary corrections. For the English Composition and Kiswahili Insha papers only one setter is commissioned for the setting. The team of moderators for each of these two papers goes over the drafts with as much thoroughness as for papers consisting of multiple-choice questions. However, they take less time on their work because they moderate only one composition/Insha.

The skills required for writing test items can only be acquired through intensive practical training. The item writer needs to be familiar with the types and varieties of test items and with their possibilities and limitations. The Kenya National Examination Council mounts item-writers' workshops regularly to train item writers for its examinations. This is a practice that should be encouraged and supported financially by national examining boards, and local and international organisations. The financial support should incorporate training-of-trainers at such internationally recognized testing centres as the Educational Testing Service of the United States of America and the local Examinations Syndicate of the United Kingdom.

3.2.3. KCPE 1994/Science and Agriculture Paper

THE KENYA NATIONAL EXAMINATIONS COUNCIL

KCPE 1994

SCIENCE AND AGRICULTURE

Time: 2 hours

READ THESE INSTRUCTIONS CAREFULLY

1. You have been given this question booklet and a separate answer sheet. The question booklet contains 60 questions.
2. Do any necessary rough work in this booklet.
3. When you have chosen your answer, mark it on the **ANSWER SHEET**, not in this question booklet.

HOW TO USE THE ANSWER SHEET

4. Use only an ordinary pencil.
5. Make sure that you have written on the answer sheet:

YOUR INDEX NUMBER

YOUR NAME
NAME OF YOUR SCHOOL

6. By shading the correct numbered ellipses (small oval shapes) mark your full Index Number (i.e. School Code Number and three-figure Candidate's Number) in the grid near the top of the answer sheet.

7. Do not make any marks outside the ellipses.

8. Keep the sheet as clean as possible and **DO NOT FOLD IT**.

9. For each of the questions 1-60 four answers are given. The answers are lettered A, B, C, D. In each case only **ONE** of the answers is correct. Choose the correct answer.

10. On the answer sheet, show the correct answer by shading the ellipse in which the letter chosen is written.

Example

In the **Question Booklet**:

16. The pressure exerted by a liquid depends on its

- A. volume
- B. depth
- C. surface area
- D. mass.

The correct answer is '**B**'.

On the **Answer Sheet**:

16	(A)	(B)	(C)	(D)
17	(A)	(B)	(C)	(D)
18	(A)	(B)	(C)	(D)
19	(A)	(B)	(C)	(D)
20	(A)	(B)	(C)	(D)

In the set of ellipses numbered 16, the ellipse with B in it is shaded.

11. Your shading **MUST** be within the ellipse. Make your shading as **DARK** as possible.

12. For each question **ONLY ONE** ellipse is to be shaded in each set of four ellipses.

This Question Paper consists of 8 printed pages.

4007

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TURN OVER

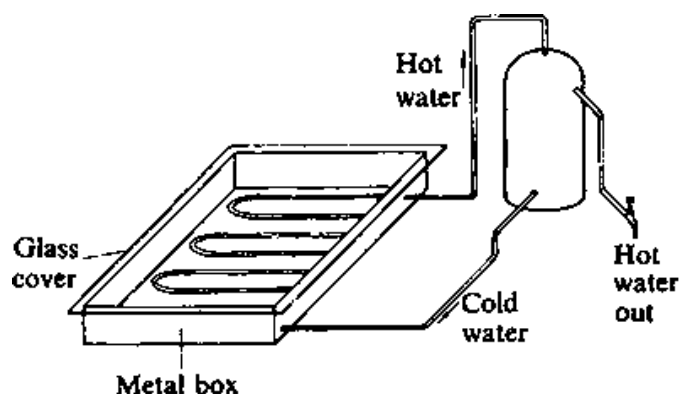
SCIENCE

1. A charcoal burner was used to boil water and the steam produced was used to turn a turbine.

Which one of the following shows the correct order of the energy changes that took place from the time the charcoal was lit to the time the turbine turned?

- A. Chemical heat mechanical.
- B. Heat chemical mechanical.
- C. Chemical mechanical heat.
- D. Heat mechanical chemical.

2. The diagram below represents a solar heater.



Which of the following would make the water heat up faster?

- A. Painting the pipe black and the inside of the metal box white.
 - B. Painting the glass cover white and the inside of the metal box black.
 - C. Painting the pipe black and reducing the number of coils.
 - D. Painting both the pipe and the inside of the metal box black.
3. The purpose of a fuse in a circuit is to
- A. break the circuit when necessary
 - B. reduce the current
 - C. switch the current on and off
 - D. complete the circuit.
4. Which one of the following mixtures can be separated by decanting?
- A. Sand and water.
 - B. Sand and sugar.
 - C. Salt and water.
 - D. Salt and iron filings.
5. Which one of the following is **NOT** a correct method of determining whether a piece of metal is a magnet or not?
- A. Repulsion between the metal and a magnet.
 - B. Attraction between the metal and a magnet.
 - C. Attraction between the metal and a pin.
 - D. Suspending the piece of metal in air to observe the direction it points to.
6. Standard seven pupils carried out an investigation on mixing liquids. They used four liquids **P**, **Q**, **R** and **S** and made the following observations:
- Liquid **P** mixed with liquid **Q**
 - Liquid **P** mixed with liquid **R**
 - Liquid **Q** mixed with liquid **R**
 - Liquids **P**, **Q**, **R** did not mix with liquid **S**.

They then poured all the four liquids into a transparent bottle and shook the bottle.

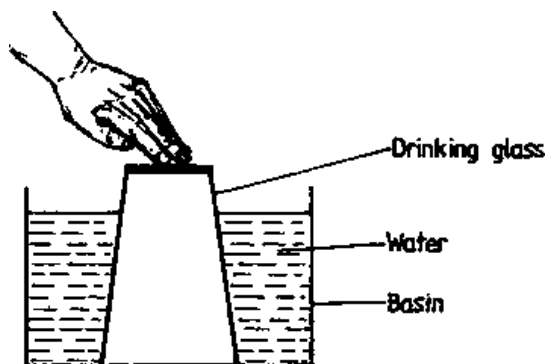
The number of layers that were formed is

- A. one
- B. two
- C. three
- D. four.

7. Which one of the following gases makes approximately one fifth of air by volume?

- A. Nitrogen.
- B. Carbon dioxide.
- C. Oxygen.
- D. Water vapour.

8. A drinking glass was inverted over water in a basin and pushed down as shown in the diagram below.



Water did not enter the glass because

- A. air occupies space
- B. water is denser than air
- C. the glass is upside down
- D. water cannot move upwards.

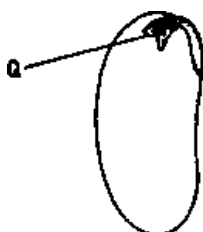
9. The correct unit for expressing density is

- A. g
- B. g/cm
- C. g/cm²
- D. g/cm³.

10. A boat sinks deeper in a fresh water lake than in sea water. This happens because sea water differs from lake water in

- A. mass
- B. volume
- C. density
- D. weight.

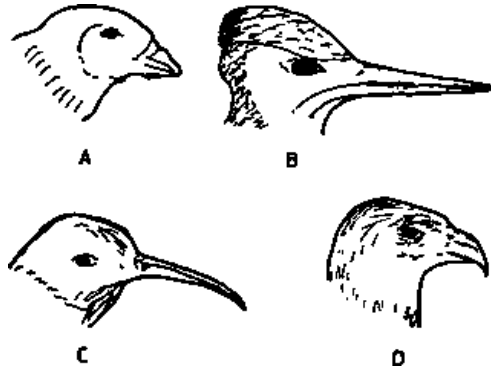
11. A section through a bean seed is shown in the diagram below.



The part labelled **Q** is the

- A. hilum
- B. plumule
- C. radicle
- D. cotyledon.

12. Which one of the following diagrams represents the beak of a flesh eating bird?



13. Which one of the following parts of a flower is correctly matched with its function?

Part	Function
A. Stigma	Produces pollen grains.
B. Petals	Attract insects.
C. Anther	Receives pollen grains.
D. Style	Holds the anther.

14. Use the information below to answer the question that follows.

Frogs eat grasshoppers.
 Grasshoppers eat grass.
 Snakes eat frogs.

From this information, which one of the following is the correct food chain?

- A. Frogs \Rightarrow grasshoppers \Rightarrow grass \Rightarrow snakes.
- B. Snakes \Rightarrow frogs \Rightarrow grasshoppers \Rightarrow grass.
- C. Grass \Rightarrow grasshoppers \Rightarrow frogs \Rightarrow snakes.
- D. Grass \Rightarrow grasshoppers \Rightarrow snakes \Rightarrow frogs.

15. Which one of the following seeds is NOT correctly matched with its agent of dispersal?

Seed	Agent
A. Pawpaw	Animal.
B. Coconut	Water.
C. Black jack	Animal.
D. Castor	Wind.

16. Which one of the following parts of an insectivorous plant is adapted for trapping insects?

- A. Flower.
- B. Leaf.
- C. Stem.
- D. Fruit.

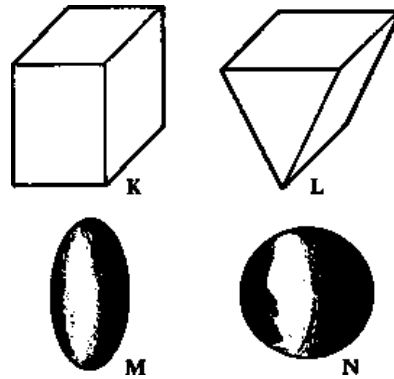
17. The correct life cycle of a mosquito is

- A. adult larva pupa egg
- B. egg pupa larva adult
- C. adult pupa larva egg
- D. egg larva pupa adult.

18. The thick layer of fat under the skin of a whale is for

- A. keeping the skin of the whale oily
- B. making the whale heavier
- C. keeping the body of the whale warm
- D. making the whale float in water.

19. Mary cut four pieces from a yam whose shapes are as shown in the diagrams below.



She then held each piece by the top and pushed it downwards in a jar containing water. Which one of the pieces would Mary find easier to push down?

- A. K.
- B. L.
- C. M.
- D. N.

20. The diagram below represents a simple machine.



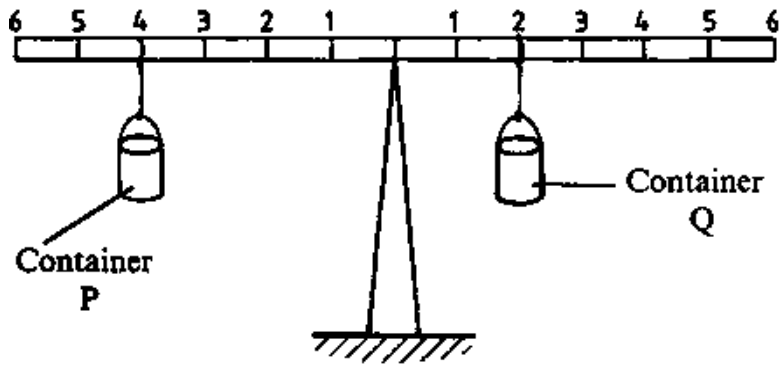
Which one of the following simple machines is of the same type as the one shown in the diagram?

- A. Gear wheel.
- B. Crow bar.
- C. Winch.
- D. Inclined plane.

21. In which of the following **pairs** do both machines have the fulcrum between the load and the effort?

- A. Bottle opener, wheel barrow.
- B. Seesaw, pliers.
- C. Hammer, nut cracker.
- D. Pair of scissors, fishing rod.

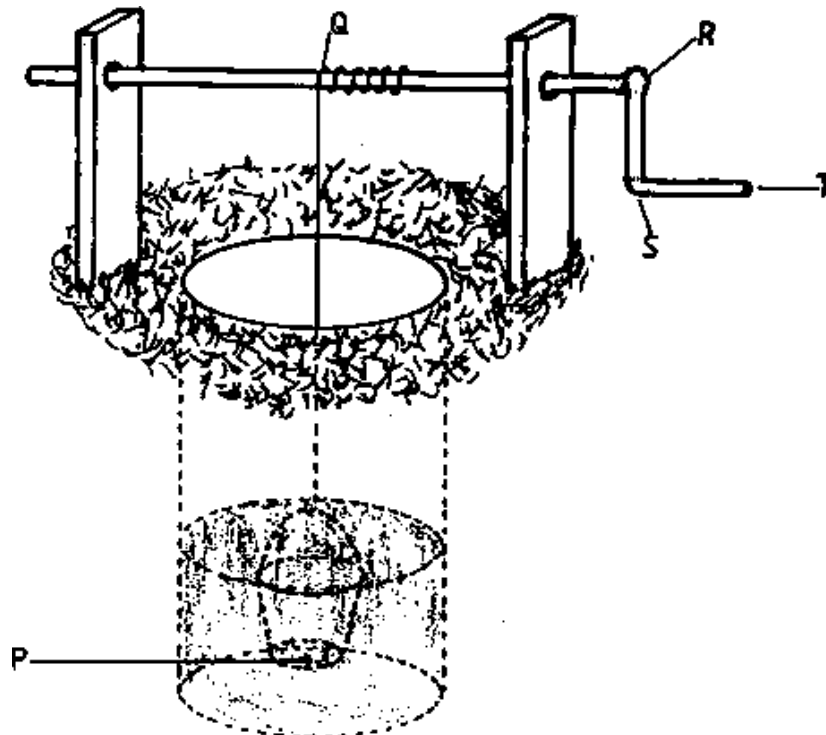
22. Two identical containers **P** and **Q** containing water were balanced on a beam. The set up is as shown in the diagram below.



Which one of the following statements about the set up is **CORRECT**?

- A. Container **P** contains as much water as **Q**.
- B. Container **P** contains a quarter as much water as **Q**.
- C. Container **P** contains half as much water as **Q**.
- D. Container **Q** contains half as much water as **P**.

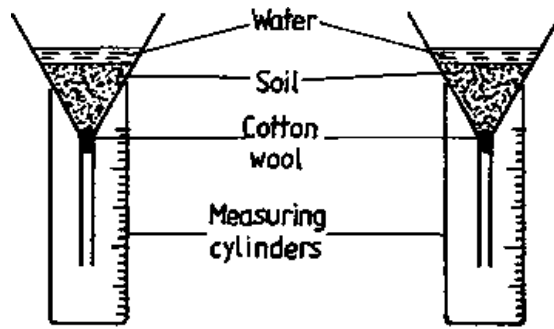
23. The diagram below represents a simple machine that can be used to raise water from a well.



Which one of the following is the effort distance?

- A. PQ.
- B. QR.
- C. RS.
- D. ST.

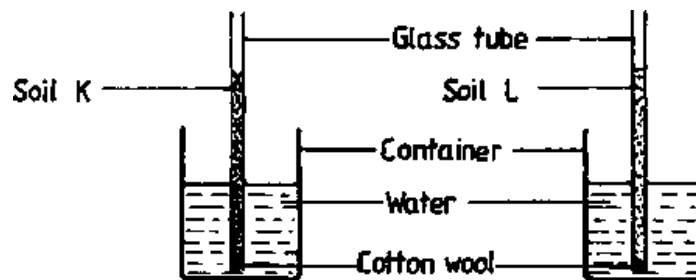
24. An experiment was set up as shown in the diagrams below.



The experiment was to investigate

- A. water retention by different types of soil
- B. capillarity in different types of soil
- C. amount of air in different types of soil
- D. amount of humus in different types of soil.

25. The set-ups shown in the diagram below were used to investigate how water moves up in different types of soil.



Which one of the following need **NOT** be the same in both set-ups?

- A. Size of containers.
- B. Size of glass tubes.
- C. Amount of cotton wool in each glass tube.
- D. Amount of soil in each glass tube.

26. When the arrow of a wind vane points to the east, the wind must be blowing from

- A. South to North
- B. West to East
- C. North to South
- D. East to West.

27. The rotation of the earth on its axis causes

- A. day and night
- B. phases of the moon
- C. high and low tides
- D. seasons.

28. Which one of the following materials **DOES NOT** pollute the environment?

- A. Sawdust.
- B. Broken pieces of glass.
- C. Plastic paper bags.
- D. Metal cans.

29. Cancer of the lungs may be caused by excessive
- A. chewing of khat (*miraa*)
 - B. sniffing of glue
 - C. smoking of cigarettes
 - D. drinking of beer.
30. Which one of the following drugs is **NOT** extracted from plants?
- A. Bhang.
 - B. Mandrax.
 - C. Cocaine.
 - D. Heroin.

AGRICULTURE

31. Why is it recommended to transplant seedlings late in the afternoon?
- A. To give a farmer time to prepare the field in the morning.
 - B. To avoid withering of seedlings due to strong heat.
 - C. To ensure that the ground is warm enough for the seedlings.
 - D. To allow the farmer to work when the day is cool.
32. During a visit to a local farm, Standard VII pupils found one cow lying down and unable to rise up. The cow died later. What would have been the **best** way of disposing of the dead cow?
- A. Throwing it away from the farm.
 - B. Selling it to a local butcher.
 - C. Skinning it and boiling the meat for pets.
 - D. Burying it deep in the ground.
33. Which one of the following is the correct tool for pruning small coffee branches?
- A. Handsaw.
 - B. Sickle.
 - C. Secateurs.
 - D. Hacksaw.
34. The purpose of placing litter on the floor of a brooder is to
- A. make the floor comfortable
 - B. keep the floor clean
 - C. keep the floor dry
 - D. keep the floor free from pests.
35. Which one of the following practices is carried out in order to produce clean eggs in a deep litter system of poultry rearing?
- A. Supplying green vegetable matter to the layers.
 - B. Providing oyster shells to the layers.
 - C. Giving a balanced diet to the layers.
 - D. Collecting the eggs frequently.
36. Why is it necessary to reduce green vegetable material feeds and to increase grains in the diet of rabbits during the last month before marketing?
- A. To fatten the rabbits.
 - B. To reduce the cost of feeding.
 - C. To improve the food intake.
 - D. To maintain the weight of rabbits.

- 37.** Why is it advisable to reduce watering and to remove overhead shade gradually from a nursery one week before transplanting seedlings?
- A. To allow seedlings to form the green colour.
 - B. To control pests in the nursery.
 - C. To control diseases in the nursery.
 - D. To make seedlings get used to the field conditions.
- 38.** A farmer wishes to borrow a loan from the Agricultural Finance Corporation to improve his farm. Which one of the following would be required by the Agricultural Finance Corporation before the loan is processed?
- A. Security offered by the farmer.
 - B. Records of the farmer's educational background.
 - C. Market for the farm produce.
 - D. Map showing the layout of the farm.
- 39.** Which one of the following is an advantage of zero-grazing?
- A. It requires less skill to manage.
 - B. There is less feed wastage.
 - C. It is cheap to start.
 - D. It requires less labour.
- 40.** To discourage bees from abandoning a bee hive during a dry season, it is necessary to
- A. shift the bee hive close to a water point
 - B. move the bee hive to a sheltered place
 - C. provide a sugar solution close to the bee hive
 - D. leave the bee hive undisturbed.
- 41.** Before handling newly born rabbits, it is advisable to rub the doe's bedding materials on the hands to avoid
- A. the likelihood of introducing infection to the newly born rabbits
 - B. the likelihood of rejection of newly born rabbits by the doe
 - C. disturbing and making the doe aggressive
 - D. interference with the growth of the newly born rabbits.
- 42.** Which one of the following is used as the planting material by farmers in sugar cane production?
- A. Cuttings.
 - B. Splits.
 - C. Suckers.
 - D. Seeds.
- 43.** Why is it necessary for farmers to leave strips of unploughed land between ploughed portions during seedbed preparation?
- A. To keep crop remains after harvesting.
 - B. To provide grass for grazing.
 - C. To control insect pests.
 - D. To control soil erosion.
- 44.** A farmer kept 200 layers from which she collected 165 eggs one day and 155 eggs the following day. Calculate the laying percentage of the layers for the two days.
- A. 37.5%
 - B. 50.0%
 - C. 60.0%
 - D. 80.0%

45. Which one of the following crop pests is correctly matched with the part of crop that the pests damage?

	<i>Pests</i>	<i>Part of crop</i>
A.	Weevils	Stem
B.	Aphids	Root
C.	Armyworms	Leaves
D.	Cutworms	Flowers

46. The following list shows records for Soy farm as at 31st December, 1993.

Cash in bank	Sh. 5,000
Loan from AFC	Sh. 45,000
Value of cattle on the farm	Sh. 78,000
Value of buildings on the farm	Sh. 210,000
Money to be paid to KGGCU	Sh. 15,000
Value of farm land	Sh. 350,000

Calculate the value of the assets of Soy farm.

- A. Sh. 643,000
- B. Sh. 763,000
- C. Sh. 778,000
- D. Sh. 823,000.

47. After finishing school Robi was given a piece of land by her father for which she acquired a title deed. She grows tomatoes and kales on the land. What kind of land ownership is this?

- A. Owner operator.
- B. Tenancy.
- C. Landlordism.
- D. Communal ownership.

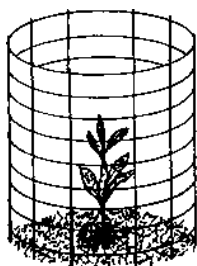
48. Small scale dairy farmers in Mwambao location are finding it difficult to sell their milk, to acquire cattle feeds and to manage their cattle. Which one of the following actions is the most appropriate for the farmers to take?

- A. Attend adult education classes.
- B. Form a co-operative society.
- C. Sell milk at the local market.
- D. Buy a lorry for milk transportation.

49. Which one of the following practices would be most suitable for improving soil fertility on a flat farm land?

- A. Application of manures.
- B. Controlling soil erosion.
- C. Application of mulch.
- D. Draining away excess water.

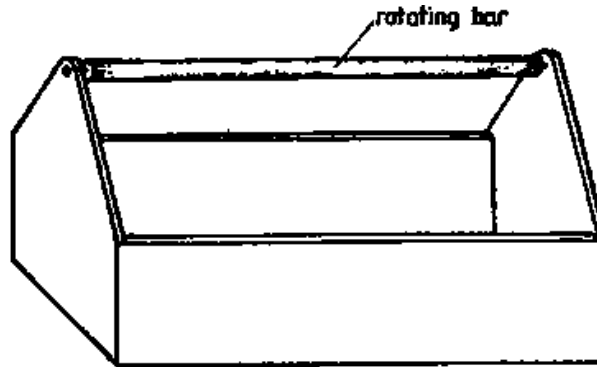
50. Below is an illustration of a tree seedling with a structure around it.



The reason for erecting such a structure around a seedling is to

- A. provide shade from strong sunlight
- B. make the seedling grow upright
- C. protect the seedling from attack by animals
- D. protect the seedling from strong wind.

51. The diagram below represents a wooden chicken feed trough.



What is the use of the rotating bar?

- A. To prevent chickens from competing for the feed.
- B. To prevent chickens from perching on the trough.
- C. To provide a resting place for chickens after feeding.
- D. To divide the trough into two feeding sides.

52. Standard V pupils collected different types of soils from their home areas for experiments. One of the soil samples was found to have the following characteristics:

- (i) *has very fine soil particles*
- (ii) *retains more water than all the others*
- (iii) *makes thinner and longer ribbons than all the others*

Which one of the following types of soils has the characteristics listed above?

- A. Clay soil.
- B. Loam soil.
- C. Sandy soil.
- D. Sandy loam.

53. Which one of the following should a calf be fed on during the first three days of its life?

- A. Calf pellets.
- B. Dairy meal.
- C. Whole milk.
- D. Colostrum.

54. 4-K Club pupils made nursery beds that were 150 cm wide. Their teacher advised them to reduce the widths to 100 cm. Why was it advisable to reduce the widths of the nursery beds?

- A. To keep the cost of watering low.
- B. To enable pupils to work without stepping on the beds.
- C. To be able to make many nursery beds in an area.
- D. To be able to produce healthy seedlings.

55. A farmer kept maize in a raised, well ventilated and properly roofed store. Later she found the maize rotting. What was the most likely cause for the rotting?

- A. Damage to the maize by pests.
- B. Wet weather conditions.
- C. High moisture content of maize.
- D. High temperature in the store.

56. In which type of record should a farmer enter the details of the quantity of farm produce sold and the amount of money obtained from the sale?

- A. Production records.
- B. Field operation records.
- C. Inventory records.
- D. Marketing records.

57. A livestock officer went to a farm to examine a sick cow. In which structure should the cow be put during examination?

- A. A pen.
- B. A shed.
- C. A crush.
- D. A hutch.

58. Which one of the following tools requires sharpening as a maintenance practice?

- A. Trowel.
- B. Chisel.
- C. Hacksaw.
- D. Fork *jembe*.

59. Which one of the following is a symptom of coccidiosis in livestock?

- A. Blood stained diarrhoea.
- B. Swollen lymph glands.
- C. Wounds in the mouth.
- D. Difficulty in breathing.

60. A local agricultural extension officer advised a farmer to include a legume crop in her crop rotation system. The main reason for including a legume is to

- A. provide feed for livestock
- B. improve the soil structure
- C. increase nitrogen content in the soil
- D. provide cover for the soil.

3.2.4. KCPE 1993/Science and Agriculture Paper

THE KENYA NATIONAL EXAMINATIONS COUNCIL

KCPE 1993

SCIENCE AND AGRICULTURE

Time: 2 hours

READ THESE INSTRUCTIONS CAREFULLY

1. You have been given this question booklet and a separate answer sheet. The question booklet contains 60 questions.
2. Do any necessary rough work in this booklet.
3. When you have chosen your answer, mark it on the **ANSWER SHEET**, not in this question booklet.

HOW TO USE THE ANSWER SHEET

4. Use only an ordinary pencil.
5. Make sure that you have written on the answer sheet:

YOUR INDEX NUMBER
YOUR NAME
NAME OF YOUR SCHOOL

6. By shading the correct numbered ellipses (small oval shapes) mark your full Index Number (i.e. School Code Number and three-figure Candidate's Number) in the grid near the top of the answer sheet.
7. Do not make any marks outside the ellipses.
8. Keep the sheet as clean as possible and **DO NOT FOLD IT**.
9. For each of the questions 1-60 four answers are given. The answers are lettered A, B, C, D. In each case only **ONE** of the answers is correct. Choose the correct answer.
10. On the answer sheet, show the correct answer by shading the ellipse in which the letter chosen is written.

Example

In the **Question Booklet**:

46. Which one of the following services is provided by the Kenya Grain Growers Co-operative Union?

- A. Provides employment to farmers.
- B. Sells inputs to farmers.
- C. Organises agricultural shows.
- D. Banks money for farmers.

The correct answer is 'B'.

On the **Answer Sheet**:

- 45 (A) (B) (C) (D)
46 (A) (B) (C) (D)
47 (A) (B) (C) (D)
48 (A) (B) (C) (D)
49 (A) (B) (C) (D)

In the set of ellipses numbered 46, the ellipse with B in it is shaded.

11. Your shading **MUST** be within the ellipse. Make your shading as **DARK** as possible.
12. For each question, **ONLY ONE** ellipse is to be shaded in each set of four ellipses.

This Question Paper consists of 9 printed pages and 3 blank pages.

3007

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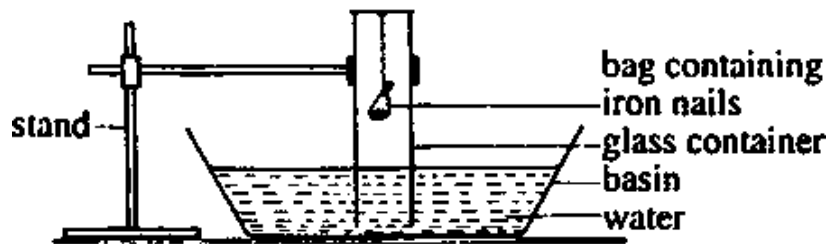
TURN OVER

SCIENCE

1. The pressure exerted by a liquid depends on its

- A. volume
- B. mass
- C. depth
- D. surface area.

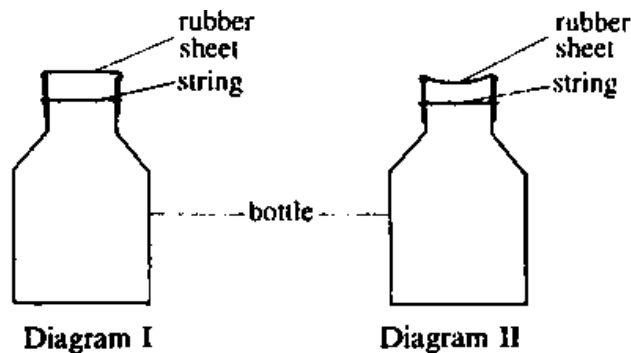
2. A small porous bag containing wet iron nails was fixed onto the bottom of a glass container. The glass container was then inverted over water in a basin as shown in the diagram below.



Which one of the following is most likely to happen if the set up is left for a few days?

- A. Level of water in the basin will rise.
- B. Level of water in the glass container will rise.
- C. Weight of the iron nails will decrease.
- D. Air bubbles will escape from the glass through the water.

3. The shape of a rubber sheet which was tied round the mouth of a bottle appeared as shown in diagram I. After immersing the bottle in cold water, the shape of the rubber sheet appeared as in diagram II.



The shape of the rubber sheet changed because

- A. the rubber sheet absorbed air
- B. air in the bottle expanded
- C. air escaped through the rubber sheet
- D. pressure in the bottle decreased.

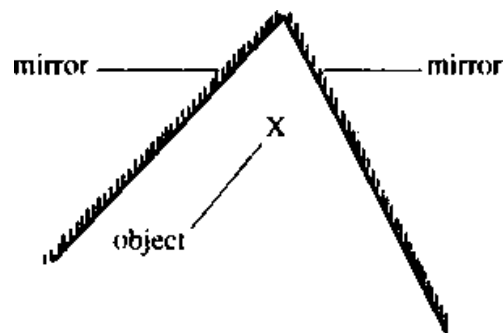
4. Four groups of pupils **P**, **Q**, **R** and **S** wanted to compare rates of evaporation of different liquids. The materials set up by each group were as follows:

- P** Identical containers with different amounts of liquids.
- Q** Identical containers with equal amounts of liquids.
- R** Different sizes of containers with equal amounts of liquids.
- S** Different sizes of containers with different amounts of liquids.

Which one of the groups of pupils set up the materials **CORRECTLY**?

- A. **P**
- B. **Q**
- C. **R**
- D. **S**

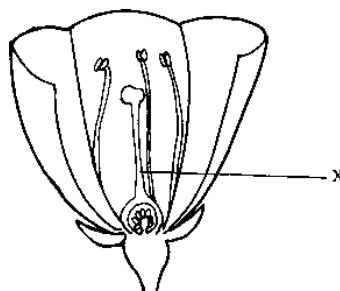
5. Two mirrors were placed as shown in the diagram below.



If an object is placed at point X, which one of the following would be TRUE?

- A. Many images will be formed.
 - B. The image formed will be smaller than the object.
 - C. Only one image will be formed.
 - D. The image formed will be upside down.
6. A kerosene stove was used to boil water to produce steam for turning a model turbine. Which one of the following shows the correct order of energy changes that took place?
- A. Heat chemical mechanical.
 - B. Chemical heat mechanical.
 - C. Chemical mechanical heat.
 - D. Heat mechanical chemical.

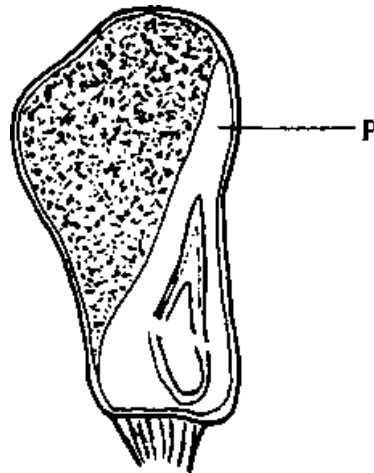
7. The diagram below represents a flower opened to show inner parts.



The part marked X is the

- A. stamen
- B. filament
- C. stigma
- D. style.

8. A section through a maize grain is shown in the diagram below.



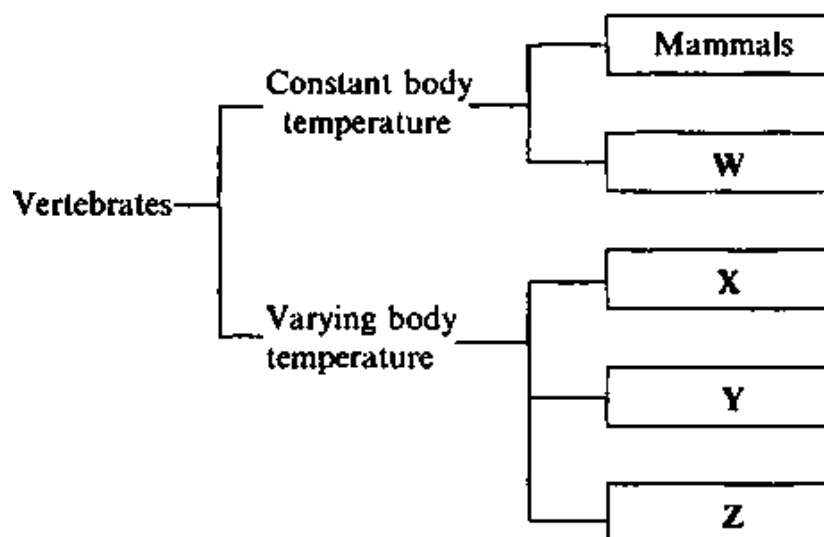
The part marked P is the

- A. radicle
- B. hilum
- C. cotyledon
- D. plumule.

9. Which one of the following animals is CORRECTLY MATCHED with its adaptation?

Animal	Adaptation
A. Hawk	Long beak.
B. Frog	Scales.
C. Praying mantis	Colour.
D. Ant-bear	Teeth.

10. The chart below shows a simple classification of vertebrates.



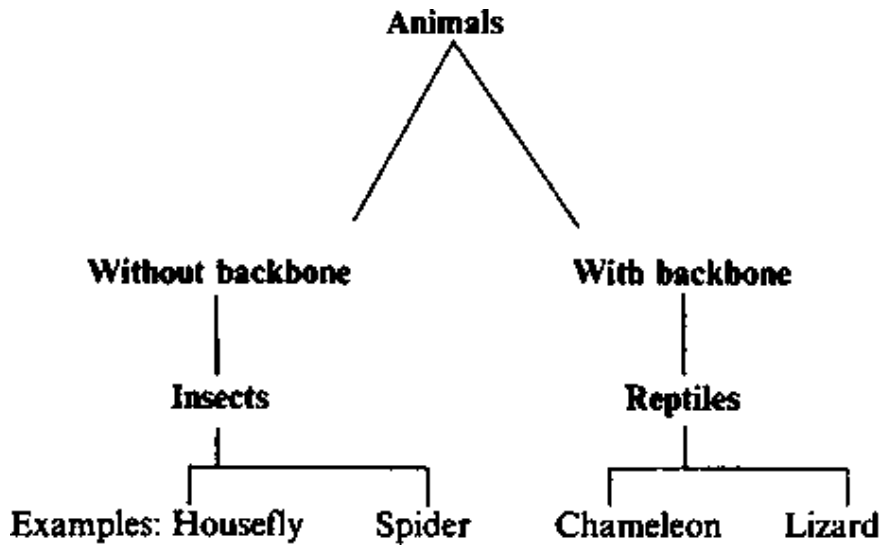
Which one of the following groups of vertebrates does **W** represent?

- A. Reptiles.
- B. Amphibians.
- C. Fish.
- D. Birds.

11. Which one of the following is a function of the pancreas? It

- A. absorbs digested food.
- B. produces digestive juice.
- C. absorbs water.
- D. stores digested food.

12. A pupil classified some animals as shown in the chart below:



Which of the following animals was NOT classified correctly?

- A. Housefly.
- B. Spider.
- C. Chameleon.
- D. Lizard.

13. When the heart of a mammal contracts, blood in the left ventricle is forced out

- A. through the aorta
- B. through the pulmonary artery
- C. through the pulmonary vein
- D. into the left auricle.

14. A fruit of a certain plant is shown in the diagram below.

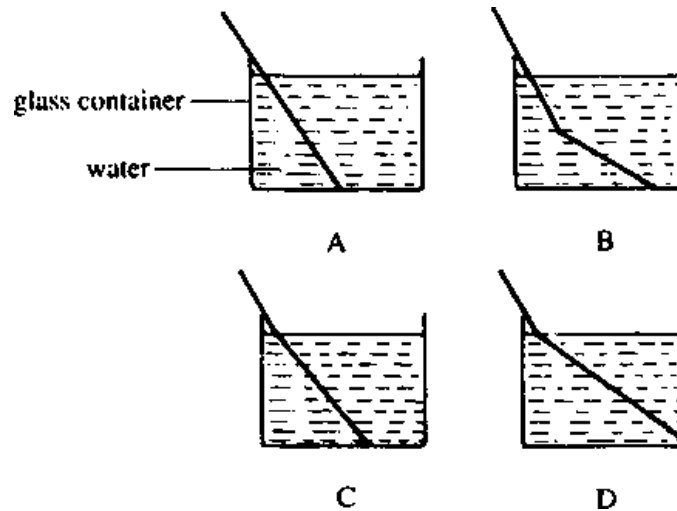


The fruit is mainly dispersed by

- A. wind
- B. animals
- C. explosive mechanism
- D. water.

15. Kijita dipped a ruler in water in a glass container.

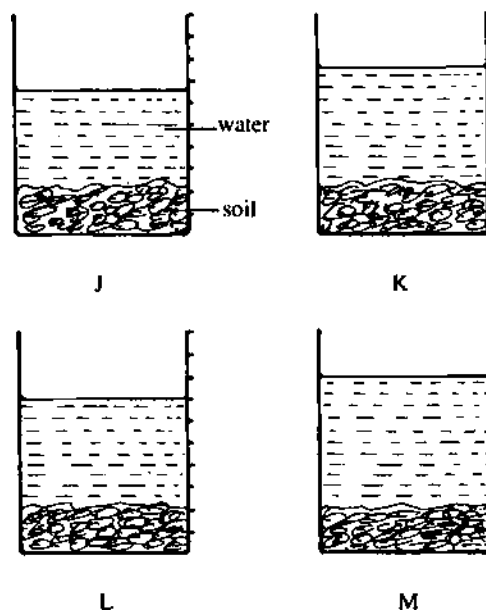
Which of the following diagrams shows how the ruler appeared when viewed from the side of the glass?



16. Which one of the following properties of soil does **NOT** depend on the size of its particles?

- A. Colour.
- B. Water retention.
- C. Drainage.
- D. Texture.









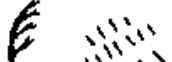




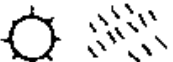

17. Equal amounts of different types of soils **J**, **K**, **L** and **M** were put into four identical glass containers. Equal volumes of water were then added to each container. After all the air had escaped from the soil in each container, the levels of water in the containers were as shown in the diagrams below.



Which one of the following conclusions about the soils is correct?

- A. Soil **L** had more air spaces between its particles than soil **K**.
- B. Soil **M** had the most air spaces between its particles.
- C. Soil **K** had less air spaces between its particles than soil **M**.
- D. Soil **J** had the least air spaces between its particles.

18. The chart below shows a record of weather made by pupils in Standard Five for a week.

	Morning	Afternoon	Evening
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			

Key  strong wind;  sunny;  cloudy;  rain.

Which one of the following statements about the weather chart above is **correct**?

- A. It only rained after strong winds blew earlier in the day.
- B. It was cloudy in all the afternoons.
- C. It was sunny everyday in the morning and windy everyday in the afternoon.
- D. Strong winds blew in the mornings on more days than in the evenings.

19. As Katinda was walking from home to school early in the morning, she saw her shadow on her right hand side and the school directly ahead of her.

In which direction was the school from where she was?

- A. East.
- B. West.
- C. North.
- D. South.

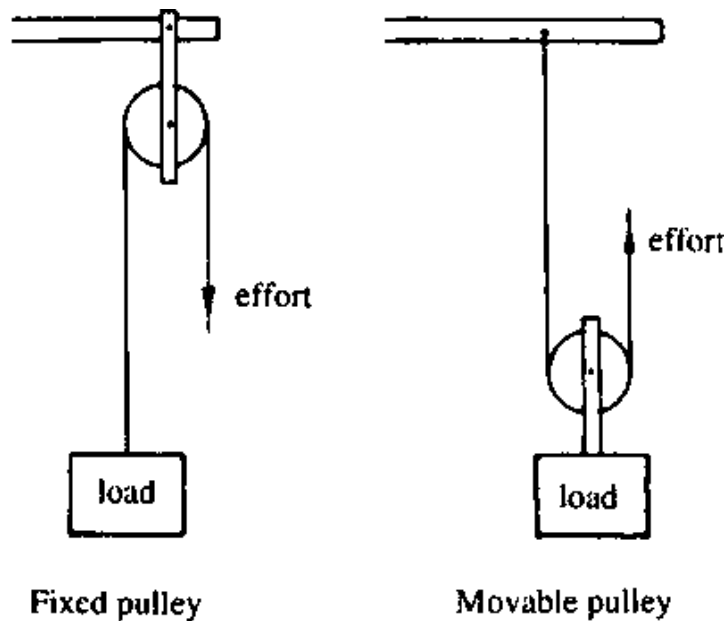
20. Amina was instructed by the doctor to take two teaspoonfuls of some medicine after every six hours for five days. She forgot the instructions and took four teaspoonfuls of the medicine at once. After realising her mistake, Amina should have

- A. sought immediate advice from a doctor
- B. taken the medicine only after the next twelve hours
- C. drunk plenty of water to dilute the medicine
- D. continued taking the medicine correctly as instructed.

21. Cirrhosis is a disease of the liver which is commonly caused by excessive

- A. drinking of beer
- B. smoking of tobacco
- C. chewing of *miraa*
- D. inhaling of cobbler's glue.

22. Movable and fixed pulley arrangements shown in the diagram below were used separately to lift a load by a distance of one metre.



Which one of the following shows the correct distances moved by the effort in each case?

	Fixed pulley	Movable pulley
A.	1 m	1 m.
B.	2 m	1 m.
C.	1 m	2 m.
D.	2 m	2 m.

23. Which one of the following practices does **NOT** pollute the environment?

- A. Spilling used oil in a forest away from homes.
- B. Spraying some oil in a lake to kill mosquito larvae.
- C. Dumping vegetable remains in a farm near homes.
- D. Dumping factory wastes into a river that flows into the sea.

24. The chart below shows a feeding relationship in a certain habitat.

Grass ⇒ Insects ⇒ Lizards ⇒ Snakes.

Note: The arrow points to the eater.

If a disease killed all the lizards, which one of the following would be the immediate effect?

	Grass	Insects	Snakes
A.	Decrease	increase	decrease.
B.	Increase	increase	decrease.
C.	Decrease	decrease	decrease.
D.	Increase	decrease	decrease.

25. The diagram below shows a loaded wheelbarrow being pushed.



Which one of the following represents the effort distance?

- A. QS.
- B. PS.
- C. QR.
- D. PR.

26. Juma sat on the seesaw at point P while John sat at point Q. The seesaw tilted lifting John up.

Which one of the following should John do in order to balance with Juma?

- A. Move nearer the fulcrum.
- B. Remain at Q and press the seesaw downwards.
- C. Move the fulcrum closer to himself.
- D. Move further away from the fulcrum.

27. In which one of the following activities does a man need to reduce friction?

- A. Walking downhill.
- B. Writing on a piece of paper.
- C. Sliding a carton of milk across a table.
- D. Picking bottles from a crate.

28. A transparent plastic container was filled with water. Two small holes were then made, one on the lid and the other at the bottom. It was noticed that when both holes were open, water flowed out through the bottom hole. When the top hole was closed, the flow of water stopped. The flow of water stopped because

- A. water in the container is denser than air
- B. pressure in water is greatest at the bottom
- C. air pressure in the container increased
- D. pressure exerted by the water is equal to the air pressure at the bottom hole.

29. A little amount of water in a tin can was heated and the water allowed to boil for sometime. The tin was closed firmly and cold water poured on it. The can collapsed suddenly. This happened because

- A. pressure outside the tin can increased
- B. pressure inside the tin can increased
- C. the contraction of tin can was sudden

D. pressure inside the tin can decreased.

30. A small piece of glass was cut off from a large sheet of glass. Which one of the following properties of glass does **NOT** change after the cutting?

- A. Mass.
- B. Weight.
- C. Volume.
- D. Density.

AGRICULTURE

31. Which one of the following sheep breeds is kept for wool production?

- A. Maasai.
- B. Merino.
- C. Blackhead Persian.
- D. Dorper.

32. Which one of the following sets of characteristics apply to a dairy cow?

- A. Early maturity and block shaped body.
- B. Thick neck and high fertility.
- C. Short legs and strong back.
- D. Well developed udder and wedge shaped body.

33. Which one of the following parasites **CANNOT** be controlled by rotational grazing?

- A. Ticks.
- B. Tapeworms.
- C. Tsetse flies.
- D. Liver flukes.

34. A farmer noticed that one of his cows was eating objects such as clothes and soil.

What action should the farmer take to correct this behaviour?

- A. Give the cow more feed.
- B. Give the cow feed rich in proteins.
- C. Separate the cow from others.
- D. Give the cow mineral salts.

35. The diseases below attack the animals shown against them.

Disease	Animals attacked
Anthrax	cattle, sheep, goats
Foot and mouth	pigs, sheep, cattle, goats
Nagana	camels, pigs, sheep, goats, cattle
Coccidiosis	chickens, rabbits, sheep.

Which of the following animals are attacked by **all** of the above diseases?

- A. Cattle.
- B. Goats.
- C. Sheep.
- D. Pigs.

36. Which one of the following characteristics can be used to identify a hen that has stopped laying when culling poultry?

- A. Bright and alert eyes.
- B. Large and warm comb.
- C. Large and moist vent.
- D. Dry comb and hard abdomen.

37. The reason for smearing grease on wires that suspend Kenya Top-bar hive is to prevent

- A. ants from reaching the hive
- B. the wire from rusting
- C. rats from reaching the hive
- D. birds from resting on the wire.

38. A farmer built a house for his chickens to stay in at night and provided watering points for the chickens in the farm.

What system of poultry rearing was the farmer practising?

- A. Free range.
- B. Deep litter.
- C. Battery cage.
- D. Fold.

39. Which one of the following statements describes the term **mixed farming**?

- A. Growing cereal and leguminous crops together.
- B. Rearing livestock and growing crops on the same farm.
- C. Rearing livestock and keeping poultry on the same farm.
- D. Growing vegetables and cash crops together.

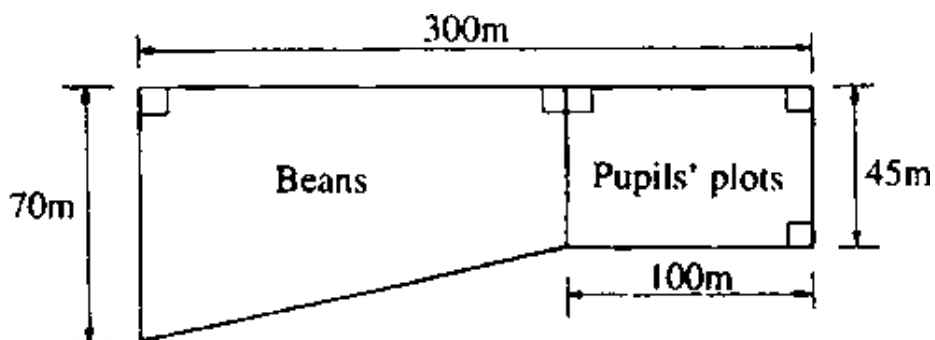
40. How do plants help to control soil erosion?

- A. By their leaves preventing rain water from reaching the ground.
- B. By their roots holding the soil particles together firmly.
- C. By their leaves preventing sun's heat from reaching the soil.
- D. By preventing moving water from passing between them.

41. What is the purpose of constructing a shade over seedlings in a nursery bed?

- A. To conserve soil moisture.
- B. To make seedlings grow taller.
- C. To improve soil fertility.
- D. To prevent rain water from reaching the seedlings.

42. The sketch map given below represents a school farm.



Calculate the area of the plot planted with beans in hectares.

- A. 1.15 ha.

- B. 1.35 ha.
- C. 1.40 ha.
- D. 2.10 ha.

43. A farmer noticed that his maize at flowering stage had holes on the leaves and stems.

Which one of the following pests is likely to have caused the damage?

- A. Aphids.
- B. Armyworms.
- C. Weevils.
- D. Stalkborers.

44. Which one of the following is an oil crop?

- A. Pawpaw.
- B. Peas.
- C. Sun-flower.
- D. Wheat.

45. Tomato plants are staked in order to

- A. allow for easy pruning.
- B. keep the fruits off the ground.
- C. allow uniform ripening of fruits.
- D. prevent the fruits from being damaged by insects.

46. Which one of the following entries should **NOT** be entered under Input records?

- A. Foods given to poultry.
- B. Fertilizers used for planting.
- C. Eggs sold to the market.
- D. Pesticides applied to crops.

47. Mrs. Juma kept the following information in the records for her dairy cattle:

- Dates when cows are served
- Dates when cows are due to calve down
- Sexes of calves born
- Breeds of bulls used for service

In which one of the activities below would the above information be most useful to Mrs. Juma in managing her farm?

- A. Marketing her dairy products.
- B. Selecting suitable animals for breeding.
- C. Detecting the health of her livestock.
- D. Buying the required materials for her livestock.

48. The price of groundnuts at Mur Malanga market on one Tuesday was Shs. 65.00 per kg before mid-day, and Shs. 85.00 per kg after mid-day.

What is likely to have caused the increase in price?

- A. Less quantity of groundnuts supplied in the morning and few buyers present.
- B. Large quantity of groundnuts supplied in the afternoon and few buyers present.
- C. Less quantity of groundnuts supplied in the afternoon and many buyers present.
- D. Large quantity of groundnuts supplied in the morning and few buyers present.

49. In the month of June 1992, a farmer kept the following records:

- 1st June sold eggs for Shs. 900.00
- 4th June bought layers mash for Shs. 1,080.00
- 8th June sold carrots for Shs. 1,000.00
- 16th June sold cabbages for Shs. 2,400.00
- 20th June bought fertilizers for Shs. 1,000.00
- 30th June bought fungicides for Shs. 300.00

What profit or loss did the farmer make during the month of June 1992?

- A. A profit of Shs. 1920.00.
- B. A loss of Shs. 2380.00.
- C. A profit of Shs. 4300.00.
- D. A loss of Shs. 6680.00.

50. Which one of the following organisations provides loans for farming?

- A. 4-K Clubs.
- B. Agricultural Society of Kenya.
- C. Young Farmers Clubs.
- D. Agricultural Finance Corporation.

51. In which one of the following land tenure systems does a farmer have full right to the use of land?

- A. Tenancy.
- B. Communal ownership.
- C. Individual owner operator.
- D. Co-operative.

52. Which one of the sets of tools and equipment listed below is the most appropriate to use when constructing a wooden chicken feed trough?

- A. Handsaw, claw hammer, try square and tape measure.
- B. Spirit level, try square, tape measure, and handsaw.
- C. Ball pein hammer, *panga*, try square and spirit level.
- D. Try square, *panga*, tape measure and handsaw.

53. Which one of the following tools is most suitable for preparing a seedbed from a hard piece of ground that has couch grass?

- A. Garden fork.
- B. *Jembe*.
- C. Mattock.
- D. Fork *jembe*.

54. What maintenance practices should be carried out on garden tools to prevent rusting during long storage?

- A. Clean, dry and apply oil on tools before storage.
- B. Clean, dry and sharpen tools before storage.
- C. Wash the tools and replace worn out parts.
- D. Wash the tools and repair broken parts.

55. Which one of the places described below is suitable for siting a bee hive?

- A. An open place near flowering plants.
- B. A place far from a grazing field and far from a water source for bees.

- C. A sheltered place close to a water source for bees.
- D. A sheltered place close to a homestead.

56. Matera Primary School pupils have observed for a number of years that their maize crops get damaged by being blown down by strong winds.

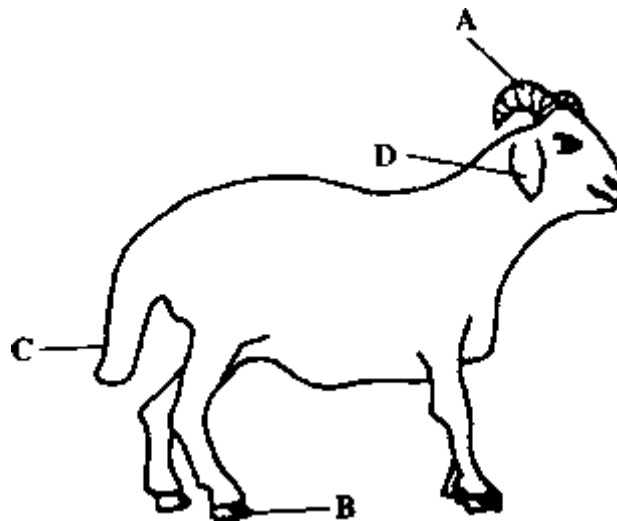
What action should they take to control the problem in future?

- A. Apply more fertilizers to their maize crops.
- B. Grow a short maize variety.
- C. Intercrop maize with beans.
- D. Plant trees around their maize plot.

57. Which one of the following sets of practices contains safety measures which should be "observed when applying insecticides?"

- A. Wearing protective clothing and using insecticides of correct concentration.
- B. Using the right type of insecticide and spraying against the direction of wind.
- C. Wearing protective clothing and using highly concentrated insecticides.
- D. Pouring the remaining insecticides on the grass and cleaning the equipment after use.

58. Below is an illustration of a sheep. Which one of the parts labelled is usually docked?



59. Which one of the following planting materials is used to establish a crop of bananas?

- A. Tubers.
- B. Suckers.
- C. Bulbils.
- D. Cuttings.

60. Why should compost materials be turned three to four times during the preparation of compost manure?

- A. To reduce the smell of compost materials.
- B. To encourage uniform rotting of compost materials.
- C. To allow fast water penetration in the compost heap.
- D. To check if the compost heap is ready for use.

3.3. Lesotho

3.3.1. Overview

End of Primary School Examination

1. Title of examination: Primary School Leaving Examination
2. Amount of fees charged: ≈ US\$2
3. Examination after years in primary school (6, 7, 8 years): 7 yrs
4. Children's entry age in primary school: 6 yrs
5. Number of pupils sitting examination in 1994: 31,396
6. Examination subjects offered: 8 subjects in 5 papers:
 - Mathematics
 - English
 - Sesotho
 - Social Studies
 - Science (Science, Home Economics, Agriculture, Health Education)
7. Language of examination: English (except for Sesotho paper)
8. Institution setting the examination questions: N.C.D.C. (National Curriculum Development Centre) and Primary Examination Office for printing
9. Have there been any reforms in the examination questions? No, but syllabi for primary schools were revised 1994 and are on trial in selected schools countrywide.
10. Stages of development of examination questions (please describe):
 - Item writing workshop for Primary School Leaving Examination by selected teachers with the assistance of subject specialists from National Curriculum Development Centre. The workshop is conducted by the Examination Office with the assistance of the Office of Evaluation, Research and Testing.
 - Editing and proofreading of developed items by Evaluation, Research and Testing Division. Final proofreading by subject specialists.
 - Banking of good items by Evaluation, Research and Testing Division.
 - Two papers per subject produced by Evaluation, Research and Testing Division and printing of papers by Examination Office.
 - Pre-testing on selected sample by the Inspectorate.
 - Scoring of answer sheets on computer and item analysis coordinated by the Inspectorate.

- 11. Type of examination questions and distribution of different kind of questions.** Multiple-choice in English, Sesotho, Science, Mathematics and Social Studies; mainly recall questions; essay writing: English and Sesotho.
- 12. Is continuous assessment incorporated in the final examination?** Yes []
No [x]
- 13. Are examination items pretested?** Yes [x]
No []
- 14. Which professional groups are involved in setting the examination questions?**
- Primary school teachers
 - School inspectors
 - Primary Examination officers
 - Curriculum developers
- 15. Are the same professionals who set the examination questions involved in marking papers?** Yes []
No [x]
- If no, who marks the papers (state)?** District Education Offices select teachers for marking of English and Sesotho essays and letters.
- 16. How are examination results used for improving teaching in primary schools?** The District offices, National Curriculum Development Centre and Examination office produce a report which is sent to schools, curriculum developers and Ministry of Education for the purpose of improving teaching in primary schools. Examination results are used together with the report by the three bodies mentioned above. Evaluation, Research and Testing Division conducts an analysis of items used by NCDC to improve items, and teachers to improve teaching.
- 17. To what other uses are the examination results put?** The examination results are also used for selection into secondary schools.
- 18. Main problem with Primary School Leaving Examinations?**
- Distribution of examination papers is difficult because some places are not easy to reach.
 - Security of papers is not guaranteed.
 - Production of scanner sheets.

3.3.2. Item Writing for Primary School Leaving Examination in Lesotho

National Curriculum Development Centre (N.C.D.C.)

Introduction

During last week of October the Primary School Leaving Examination (PSLE) is administered countrywide. The time table which has been given to the head-teachers is followed to the letter. Five subjects are tested, namely: English, Sesotho, Mathematics, Science and Social Studies. These subjects are normally scheduled to be administered in four days. The language subjects Sesotho and English have three papers each. The first paper requires a composition on one of the two given topics. The second paper deals with composing a letter, and the third paper contains multiple-choice questions on comprehension and usage of the language. The other three subjects test the candidates by applying multiple-choice items.

In 1993 about 31,887 students enrolled for PSLE but the actual number of students who sat

for PSLE were 31,979 of which 8,725 got the first division (1st class), 8,644 got the second class and 11,665 got third class. Only 1,742 students failed, while the total number of passes was 29,034 (90.8% of candidates who sat for PSLE).

The Development of the Item Bank

In 1987 it was decided that an item bank should be built up for the PSLE. The banked items would be pre-tested and statistically analysed. The Evaluation and Testing (E&T) Division of the National Curriculum Development Centre (NCDC) was then assigned the task of developing and building up the bank.

Step 1

The E&T Division consults with different subject divisions which in turn nominate a number of teachers (normally five per subject area) to attend the item writing workshop. It was felt that the contribution made by teachers towards this exercise would be more appropriate.

The criteria used are as follows:

- (a) Subject panel members: This criteria has the disadvantage of not giving many different teachers a chance to gain an idea of proper item writing.
- (b) Resource teachers: The aim here is that when the teachers get back to their respective regions they will share whatever knowledge they have gained on good item writing with their colleagues.
- (c) Teachers from different localities throughout the country: The idea is the same as above; teachers would spread the message to teachers in their schools and neighbouring schools on how to write good items.

The subject divisions are encouraged to mix their nominees; e.g. out of five people, at most two teachers should already have attended the workshop while the other three teachers should be new to the exercise. The aim is that the experienced teachers give a lead to the inexperienced teachers.

Step 2

The item writing workshop normally runs for five days. On the first day and the first half of the second day teachers are introduced to the item writing circle as well as given tips on how to write good items. They are also given examples of items which are considered to be good or to be poor.

Teachers start writing items from the second half of the second day up to the fourth day. On the fifth day, teachers are normally given a chance to go through their work to convince themselves that they have produced what is required. From the very first day of the workshop, the representatives of the subject divisions work with the E&T group to guide teachers. Since teachers work in different groups according to the subjects they write items for, each representative of subject divisions works with his/her subject group.

Step 3

The following step after the item writing workshop is that of editing the items written by teachers. This exercise is done by the E&T group. Immediately after editing, the test papers are compiled using the edited items. When the papers are ready, the E&T Division passes them over to the respective subject divisions where the items are edited further. After the second editing the E&T Division produces final test papers ready for printing.

For each subject, two test papers are produced (papers A and B). The purpose of having two papers is to increase the chances of having many good items during pretesting (those items that show good statistical characteristics when analyzed).

Step 4

The test papers are taken for printing at this stage. The printing is done by the Instructional Materials Resource Centre (I.M.R.C.) unit, which also falls under the Ministry of Education (MOE).

During the printing of the test papers the E&T Division together with the Primary Examinations Office (PEO) selects a sample of schools in which pre-testing will take place.

The criteria for selecting schools takes a number of factors into consideration:

- The size of the district (the number of schools per district).

The locality of the school within the district (e.g. rural, urban, foothills or mountains).

- Denomination of the proprietor (more than 95% of the primary schools in the country belong to churches).
- The performance of the school at PSLE level (e.g. very high, average or very low).

The schools are then warned a month in advance about the pretest visits.

Step 5

At this stage the E&T group together with the PEO administers the pre-test exercise. This exercise takes a full month (4 weeks), and it is done in September, when pupils are just ready to sit for their PSLE. Each test paper must be taken by at least 200 pupils. The tests taken at each school are chosen at random. One school takes two sittings. That is, either two or four different tests per school, depending on the size of the school.

Step 6

The pre-testing involves only the objective type of tests. Thus, the computer answer cards are used and scored by computers. The scoring is done by the Education Statistics Unit of the MOE.

The scoring computer has been fed with a programme which has been derived from the Kuder-Richardson Formula 20 (KR20) formula, which allows it to produce item analysis immediately after scoring the cards.

Step 7

The item analysis comes out in such a way that the E&T Division can easily decide whether an item should be banked, revised or trashed altogether. The items that are banked are those which show good statistical characteristics, and these are the items that would be put in the PSLE papers.

Step 8

When the PSLE papers have to be produced the E&T Division consults with each subject division to decide on the items that should be included in the papers. For this exercise the subject divisions are encouraged to use a table of specification (test blueprint) so that they can avoid bias.

When the items have been decided upon by the subject divisions, the E&T Division compiles the test papers, which in turn are proofread by the respective subject divisions. The camera-ready copies are then produced by the E&T Division and handed over to the PEO. It is the responsibility of the Primary Education Office to see that the test papers are printed, parcelled and sent to schools under very tight security. The PEO gets full help from the District Education Offices in order to perform these duties.

Step 9

The administration of the examinations is done by invigilators, who also have to send the candidates' papers to the relevant centres. The invigilators normally are teachers of class 6 and they should neither be headteachers nor should they be class 7 teachers as well. This is simply because these two categories of teachers have to be there when the examinations are being administered in their schools. The selection procedure takes place each year in September and at that very same time the test booklets are sent to schools; their safety is left with the head of the school. The invigilators are given a one-day training on how to conduct the PSLE and are also given each a PSLE administrators manual.

Step 10

After the PSLE results have been processed the item analysis of the objective tests is produced and sent to the E&T Division which decides on which items should be banked, revised or discarded.

Step 11

The District Education Offices are required to send comments to the E&T Division after marking the essays and letters. The required comments should have been made by markers, and they should be on points which they feel teachers should lay more emphasis on when teaching. The subject divisions also comment on problems concerning classroom teaching. They perform this exercise with the help of the E&T Division, on the basis of item analysis produced from the test papers. The E&T Division then produces a report based on all those comments and sends it to the schools.

Subjective Tests

Most of the steps outlined above prepare the objective tests candidates take. The subjective tests, that is, essays and letters for the languages, are not pre-tested. However, the topics are recommended by the teachers during the item writing workshop. The respective subject divisions are consulted by the E&T Division for them to decide on the topics which should be included in the PSLE papers.

Conclusion

PSLE is the only instrument on which to test and measure the ability and the extent of instruction at primary level. It is the only means that assesses countrywide the amount of skills, knowledge, and attitudes acquired in seven years of the learners' exposure to classroom instruction. It is still a way of selecting students who should proceed with higher education (post primary education).

However the Evaluation Research and Testing Division of the National Curriculum Development Centre presently explores a different way of assessment, whereby at the end of classes 3 and 6 students' achievements in Maths, English and Sesotho will be checked. The time and exposure given to the item writing during the workshops with teachers is too short. It is possible that some teachers write poor items because they may not have grasped some of the concepts. There has never been a chance to make a follow-up on teachers to ensure that they do share whatever they have gained with their colleagues.

3.3.3. Primary School Leaving Examination, Standard 7, 1994/Science Paper

KINGDOM OF LESOTHO
MINISTRY OF EDUCATION
PRIMARY SCHOOL LEAVING EXAMINATION
STANDARD 7
OCTOBER 1994
SCIENCE

(Time: 1 hour 30 minutes)

(Marks: 70)

GENERAL INSTRUCTIONS

1. Use only **PENCIL** on your answer sheet.
2. When you have chosen the answer to a question, shade in the letter space **COMPLETELY** for that answer on the answer sheet.

Example: [A] [B] [D] [E]

3. If you wish to change any answer you have chosen, use a rubber to rub out the **mark COMPLETELY** and then make a new mark. If you do not rub out completely the machine may mark the answer wrong.
4. Examples have been given to help you. Read them carefully before you start doing the questions.

SAMPLE QUESTIONS

I. Food should always be covered to keep away _____.

- A) smell
- B) flies
- C) people
- D) rats

The correct answer is "B". You would shade in the space for B on your answer sheet.

[A] [C] [D] [E]

II. Milk is a _____.

- A) crystal
- B) solid
- C) liquid
- D) gas

The correct answer is "C". You would shade in the space for C on your answer **sheet**.

[A] [B] [D] [E]

1. Which sense does Mpho use to tell that there is some nicely cooked food?

- A) sight
- B) touch
- C) hearing
- D) smell

2. Which sense is used to tell that water is cold or hot?
- A) Touch
 - B) Smell
 - C) Taste
 - D) Hearing
3. Where does the moon get its light from?
- A) Earth
 - B) Itself
 - C) Sun
 - D) Star
4. What can be done to the plough wheels that make a lot of noise?
- A) wash the wheels
 - B) oil the wheels
 - C) spray the wheels with water
 - D) punch the wheels
5. Which of the following substances dissolves in water?
- A) sand
 - B) sugar
 - C) wheat-meal
 - D) maize meal
6. Which of the following will help in pollinating roses?
- A) Sheep
 - B) Birds
 - C) Bees
 - D) Man
7. Which one of the following animals is covered with scale?
- A) Horse
 - B) Cow
 - C) Hen
 - D) Tortoise
8. How does a fish move? It _____.
- A) swims
 - B) climbs
 - C) hops
 - D) runs
9. Fish uses _____ for breathing.
- A) gills
 - B) stomata
 - C) lungs
 - D) pores
10. _____ soil has big particles.
- A) clay
 - B) sand

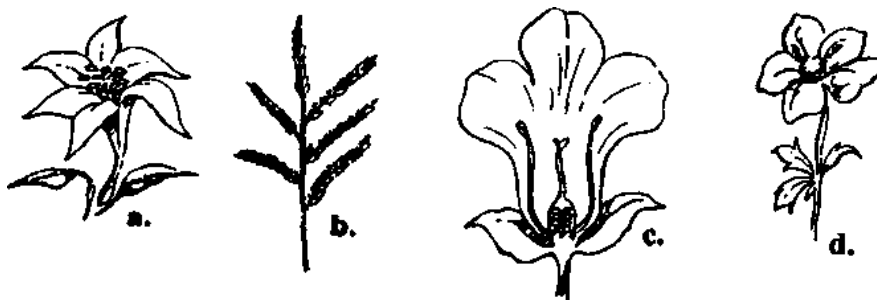
- C) loam
- D) aluvial

11. What kind of soil holds water for a long time?

- A) loam
- B) sand
- C) clay
- D) gravel

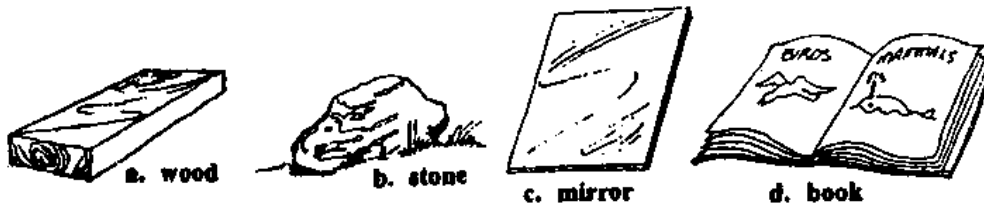
12. Which of the following flowers is a maize flower?

- A) d
- B) a
- C) c
- D) b



13. Which one of the diagrams below will reflect the rays of the sun when directed to it?

- A) b
- B) a
- C) c
- D) d



14. See the picture below. What will help the milk go out of the container?

- A) Air pressure
- B) Tea
- C) Cup
- D) Jar



15. What happens to the wax when a candle burns? It _____.

- A) expands
- B) becomes black
- C) becomes yellow
- D) melts

16. In the diagram below what will happen to the magnets? They will _____ each other.

- A) repel
- B) attract
- C) miss
- D) change



17. Tau rubs a ruler on his head and after some few seconds the ruler was able to attract pieces of papers. This shows that a ruler becomes a _____.

- A) magnet
- B) permanent magnet
- C) radiator
- D) temporary magnet

18. How does a scorpion respond when being touched?

- A) runs away
- B) raises its sting
- C) fights
- D) stays still

19. Which part do plants use for breathing?

- A) stem
- B) flowers
- C) leaves
- D) roots

20. Which machine can you use to cut through a large piece of wood?

- A) Axe
- B) Knife
- C) Nail
- D) Hoe

21. How did Mphatlalatsane derive its name? It appears _____.

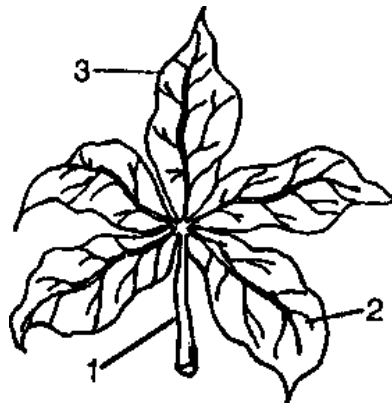
- A) in the middle of the day
- B) before sun set
- C) before sun rise
- D) after sun set

22. Which one of the following shows a complete life cycle of a grasshopper?

- A) pupa, egg, adult and larva
- B) adult, larva, egg and pupa
- C) larva, pupa, adult and egg
- D) egg, larva, pupa and adult

23. Which one of the following animals lives partly in water and on land?
- A) frog
 - B) rat
 - C) hare
 - D) cat
24. Which of these is a wild animal?
- A) Cat
 - B) Hare
 - C) Lamb
 - D) Cow
25. _____ floats in water.
- A) Pumpkin
 - B) Stone
 - C) Egg
 - D) Feather
26. What can you use to find the perimeter of the leaf?
- A) a ruler
 - B) a string
 - C) a tape measure
 - D) foot steps
27. A bean pod disperses by _____.
- A) itself
 - B) wind
 - C) animals
 - D) water
28. Which of the following lists has a list of living things only?
- A) paper, plastic, rose
 - B) horse, stone, soil
 - C) man, cat, carrot
 - D) house, bag, boy
29. When bicarbonate of soda is mixed with vinegar it will _____.
- A) melt
 - B) make bubbles
 - C) change colour
 - D) evaporates
30. Which agent will help in breaking down rocks into small particles?
- A) paper
 - B) road
 - C) water
 - D) insects
31. Tseli is ill and she goes to the clinic to see the doctor. The doctor uses _____ thermometer to measure her body temperature.
- A) clinical

- B) mercury
C) alcohol
D) scale
32. Which is a non-living object?
- A) cat
B) tree
C) boy
D) stone
33. One has to wear dark clothes in Winter because they _____.
- A) reflect light
B) absorb heat
C) are beautiful
D) lose heat
34. A flame needs _____ in order to keep burning.
- A) carbon
B) water vapour
C) nitrogen
D) oxygen
35. The wearing away of soil by wind and water is called _____.
- A) convection
B) conservation
C) erosion
D) migration
36. Which animal sleeps in winter?
- A) snake
B) rabbit
C) rat
D) dog
37. The chameleon takes the colour of the place where it lives in order to _____.
- A) move quickly
B) smell its food
C) protect itself
D) see other animals properly
38. The part of the leaf marked 2 is called the _____.
- A) vein
B) edge
C) midrib
D) stalk



39. Sand cannot dissolve in water. It is said to be _____ in water.
- A) inseparable
 - B) insoluble
 - C) soluble
 - D) insolvent
40. A clinical thermometer is an instrument used for measuring body _____
- A) the time of day
 - B) air pressure
 - C) rainfall
 - D) temperature
41. We can prevent soil erosion on sloping ground by _____ the slope.
- A) ploughing furrows across
 - B) frequently grazing animals on
 - C) ploughing up and down
 - D) burning vegetation on
42. Water and wind easily carry away top soil when the ground is _____.
- A) warm and fertilized
 - B) stony and wet
 - C) planted with trees
 - D) bare and dry
43. Soil erosion can be most effectively reduced on sloping fields by _____.
- A) a drainage system
 - B) contour ploughing
 - C) bustard trenching
 - D) shift cultivation
44. Which one of the following practices is a means of preventing soil erosion?
- A) Ploughing up and down the slope
 - B) Winter ploughing
 - C) Planting grass and trees
 - D) Cutting grass
45. A field crop which contains oil is _____.
- A) sorghum
 - B) maize
 - C) sunflower
 - D) wheat
46. Most of my wheat crops did not form grain but produced powder of _____ effects.
- A) pneumonia
 - B) rust
 - C) blight
 - D) mildew
47. Plants get their minerals from the _____.
- A) gravel
 - B) air

- C) clouds
D) soil
48. Lesotho is advised to construct _____ for irrigating fields during drought.
- A) dams
B) boreholes
C) tanks
D) reservoirs
49. After washing garden tools one must apply _____ on them to prevent rust.
- A) grease
B) vaseline
C) fat
D) dripping
50. Field crop which grow well in the highlands of Lesotho are _____.
- A) sorghum and sunflower
B) maize and letils
C) wheat and peas
D) barley and beans
51. We can keep our bodies fit and strong by _____.
- A) keeping our bodies clean
B) drinking a lot of water
C) eating a lot of fatty foods
D) Exercising regularly
52. Teboho does not eat carrots. Which disease is he likely to suffer from?
- A) Bleeding gums
B) Poor eye sight
C) Weak blood cells
D) Poor growth of bones
53. Drugs and alcohol are dangerous to our bodies because they _____.
- A) affect our brains and minds
B) destroy our muscles
C) cause breathing problems
D) weaken our bones
54. A prepared mixture of sugar, salt and water can be used for treating a child suffering from _____.
- A) whooping cough
B) sore throat
C) diarrhoea
D) Toothache
55. Daily exercises helps you to be _____.
- A) injured
B) healthy
C) tired
D) sleepy

56. We wash hands before eating to prevent spread of _____.
- A) fleas
 - B) flies
 - C) lice
 - D) germs
57. Before crossing the road, one must look _____.
- A) tright and down
 - B) up and down
 - C) right and left
 - D) left and up
58. If a child has headache, give him/her _____ to stop pain.
- A) sweets
 - B) cool-drink
 - C) jam
 - D) paracetamol
59. Loss of _____ is example of physical disability.
- A) limb
 - B) hearing
 - C) vision
 - D) memory
60. Cleaning of ears with a matchstick may damage the ear _____.
- A) drum
 - B) bone
 - C) tube
 - D) flap
61. Which one of these vegetables is in the same food group as meat?
- A) tomatoes
 - B) potatoes
 - C) cabbage
 - D) beans
62. Meat and other foods decay quickly in the _____.
- A) winter
 - B) spring
 - C) summer
 - D) autumn
63. _____ brush should be used to clean a plain wooden floor.
- A) Shoe
 - B) Scrubbing
 - C) Hair
 - D) Clothes
64. To find out the length of the material one of these is used.
- A) Tape measure
 - B) Scissors

- C) Thimble
D) Cord
65. Mention one article that can be made of wool.
- A) blouse
B) jersey
C) stockings
D) shirt
66. Paint stains are removed with _____.
- A) paraffin
B) solution of salt
C) sour milk
D) vinegar
67. Which is the balanced meal among these?
- A) potatoes, samp, tea
B) potatoes, meat, samp
C) soft porridge, tea, meat
D) meat, vegetable salad, rice
68. Why do you use soap when washing clothes? To remove _____.
- A) lice
B) colour of a cloth
C) dirt properly
D) bugs
69. When we clean leather shoes we need _____.
- A) rags and oil
B) polish and brushes
C) polish and rags
D) oil and brushes
70. Which stain is removed by soaking a cloth in cold water with a little salt added?
- A) grease
B) ink
C) milk
D) blood

3.3.4. Primary School Leaving Examination, Standard 7, 1993/Science Paper

KINGDOM OF LESOTHO
MINISTRY OF EDUCATION
PRIMARY SCHOOL LEAVING EXAMINATION
STANDARD 7
OCTOBER 1993
SCIENCE

(Time: 1 hour 30 minutes)

(Marks: 70)

GENERAL INSTRUCTIONS

1. Use only **PENCIL** on your answer card.
2. When you have chosen the answer to a question, shade in the letter space **COMPLETELY** for that answer on the answer card.

Example: [A] [B] [D] [E]

3. If you wish to change any answer you have chosen, use a rubber to rub out the mark **COMPLETELY** and then make a new mark. If you do not rub out completely the machine may mark the answer wrong.
4. Examples have been given to help you. Read them carefully before you start doing the questions.

SAMPLE QUESTIONS

I. Food should always be covered to keep away _____.

- A) smell
- B) flies
- C) people
- D) rats

The correct answer is "B". You would shade in the space for B on your answer card.

[A] [C] [D] [E]

II. Milk is a _____.

- A) crystal
- B) solid
- C) liquid
- D) gas

The correct answer is "C". You would shade in the space for C on your answer card.

[A] [B] [D] [E]

1. On very cold winter mornings Thabang cannot get water from a well or a tap because the water has changed to _____.

- A) snow
- B) dew
- C) frost
- D) ice

2. You can make your wheelbarrow move easier by _____ it.
- A) oiling
 - B) carrying
 - C) watering
 - D) filling
3. Lineo's mother uses a cloth to hold a hot saucepan. The cloth is a _____ conductor of heat.
- A) cold
 - B) bad
 - C) good
 - D) hot
4. The yellow dust that insects carry from plant to plant is called _____.
- A) stamen
 - B) sepal
 - C) pollen
 - D) pistil
5. A flame needs _____ in order to keep burning.
- A) oxygen
 - B) water vapour
 - C) nitrogen
 - D) carbon
6. The wearing away of soil by wind and water is called _____.
- A) migration
 - B) conservation
 - C) convection
 - D) erosion
7. A/An _____ makes it easier to get a heavy barrel onto a table.
- A) wedge
 - B) lever
 - C) inclined plane
 - D) pulley
8. Hot plates on stoves are made of metal because metal _____.
- A) is a bad conductor of heat
 - B) is a good conductor of heat
 - C) will stay cool
 - D) will burn easily
9. Which animal sleeps in winter?
- A) dog
 - B) rabbit
 - C) rat
 - D) snake

10. The chameleon takes the colour of the place where it lives in order to _____.

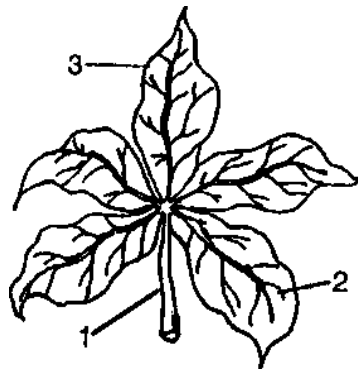
- A) protect itself
- B) smell its food
- C) move quickly
- D) see other animals properly

11. Air is a mixture of _____.

- A) salts
- B) water
- C) gases
- D) liquids

12. The part of the leaf marked 2 is called the _____.

- A) edge
- B) vein
- C) midrib
- D) stalk



13. Sand cannot dissolve in water. It is said to be _____ in water.

- A) insolvent
- B) inseparable
- C) soluble
- D) insoluble

14. A clinical thermometer is an instrument used for measuring _____.

- A) air pressure
- B) body temperature
- C) rainfall
- D) the time of day

15. The path of electricity is called a _____.

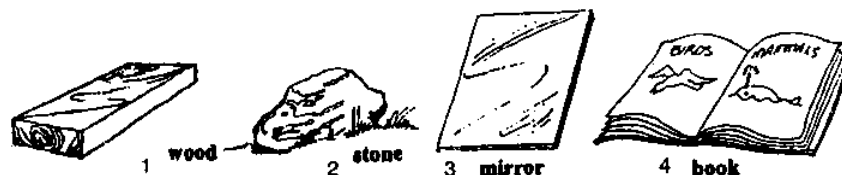
- A) switch
- B) cell
- C) circuit
- D) terminal

16. Which of the following is an electric appliance?

- A) Torch
- B) Rain gauge
- C) Barometer
- D) Thermometer

17. Light travels in _____ lines.
- A) dotted
 - B) straight
 - C) curved
 - D) broken
18. When a magnet is freely suspended it will always face _____.
- A) East-South
 - B) South-East
 - C) West-North
 - D) North-South
19. Drops of water seen on leaves of plants in the morning are called _____.
- A) rain
 - B) mist
 - C) dew
 - D) snow
20. Which sense does Mpho use to tell that there is some nicely cooked food?
- A) smell
 - B) touch
 - C) hearing
 - D) sight
21. Which sense is used to tell that water is cold or hot?
- A) Touch
 - B) Smell
 - C) Taste
 - D) Hearing
22. Where does the moon get its light from?
- A) Earth
 - B) Itself
 - C) Sun
 - D) Star
23. What can be done to the plough wheels that make a lot of noise?
- A) punch the wheels
 - B) wash the wheels
 - C) spray the wheels with water
 - D) oil the wheels
24. Which of the following substances dissolves in water?
- A) sand
 - B) sugar
 - C) wheat-meal
 - D) maize meal
25. Which of the following will help in pollinating roses?
- A) Bees
 - B) Birds

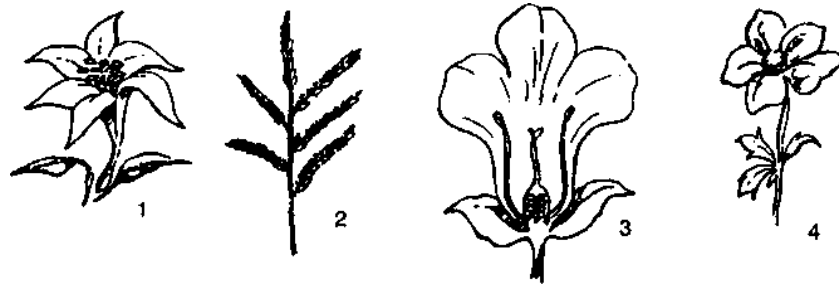
- C) Sheep
D) Man
26. Which of these soils is good for smearing (ho lila) when mixed with cow dung?
- A) Sand
B) Loam
C) Clay
D) Glavel
27. What do we call animals with backbone?
- A) Reptiles
B) Invertebrates
C) Mammals
D) Vertebrates
28. Which one of the following animals is covered with scale?
- A) Hen
B) Cow
C) Tortoise
D) Horse
29. How does a fish move? It _____.
- A) climbs
B) swims
C) hops
D) runs
30. How does a scorpion respond when being touched?
- A) raises its sting
B) runs away
C) fights
D) stays still
31. _____ soil has big particles.
- A) loam
B) clay
C) sand
D) alluvial
32. What will happen to a paper clip when put next to a magnet? It will be _____ a magnet.
- A) bend by
B) repelled from
C) stretched by
D) attracted to
33. Which one of the diagrams below will reflect the rays of the sun when directed to it?



- A) 1
B) 3
C) 2
D) 4

34. Which of the following flowers is a maize flower?

- A) 3
- B) 1
- C) 2
- D) 4



35. What kind of soil holds water for a long time?

- A) gravel
- B) sand
- C) loam
- D) clay

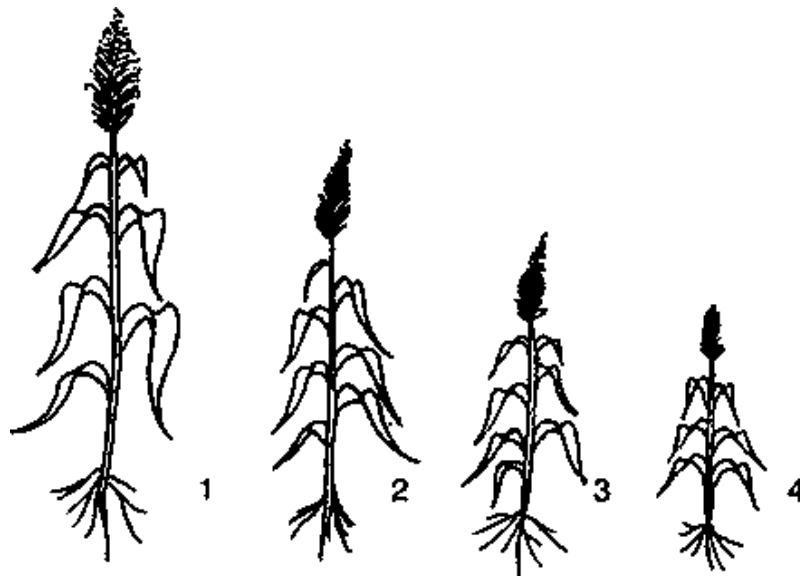
36. See the picture below. What will help the milk go out of the container?

- A) Air pressure
- B) Tea
- C) Cup
- D) Jar



37. Maize in the diagrams below was grown at the same time on different types of soil. On what type of soil was maize '1' grown?

- A) gravel
- B) clay
- C) loam
- D) sand



38. What happens to the wax when a candle burns? It _____.
- A) expands
 - B) becomes black
 - C) becomes yellow
 - D) melts
39. Name an instrument used for measuring temperature.
- A) Thermometer
 - B) Rain gauge
 - C) Syringe
 - D) Telescope
40. Which sense do we use to identify paraffin?
- A) Taste
 - B) Smell
 - C) Sight
 - D) Touch
41. _____ disease attacks dairy cows.
- A) Lice and mites
 - B) Bot
 - C) Mastitis
 - D) Bots
42. A good way to prevent wind erosion is to _____.
- A) plant trees
 - B) graze goats
 - C) build dams
 - D) make contours
43. Good top soil with plenty of _____ produce the best plants.
- A) sand
 - B) compost
 - C) air pockets
 - D) snow
44. We can prevent soil erosion on sloping ground by _____ the slope.
- A) burning vegetation on
 - B) frequently grazing animals on
 - C) ploughing up and down
 - D) ploughing furrows across
45. in order to feed the soil after we have cultivated it, we can use _____.
- A) fertilisers
 - B) rocks
 - C) water
 - D) dust particles
46. _____ insect pest attacks cabbage.
- A) Millipede

- B) Blight
 - C) Aphis
 - D) Centipede
47. _____ is used for leveling the soil.
- A) Digging fork
 - B) Rake
 - C) Spade
 - D) Hoe
48. Garden tools should be stored in a _____.
- A) fenced place
 - B) shady place
 - C) cold place
 - D) dry place
49. _____ is a root crop.
- A) Spinach
 - B) Cabbage
 - C) Potatoe
 - D) Egg plant
50. The milk turns sour because of _____.
- A) mastitis
 - B) bacteria
 - C) black quarter
 - D) boat
51. We can keep our bodies fit and strong by
- A) Exercising regularly
 - B) drinking a lot of water
 - C) eating a lot of fatty foods
 - D) keeping our bodies clean
52. If the temperature of your body is 37° C, you are probably _____.
- A) overheated
 - B) sick
 - C) fainting
 - D) healthy
53. Animals and man use the _____ stored in food to help them do work.
- A) taste
 - B) energy
 - C) colour
 - D) weight
54. _____ contain some substances which are harmful to the health of an individual.
- A) Coffee
 - B) Drinks
 - C) Sweets
 - D) Drugs

55. In order to kill germs, water should be _____ before drinking.

- A) boiled
- B) filtered
- C) covered
- D) served

56. The insect which carries disease germs to uncovered food is _____.

- A) louse
- B) bee
- C) house fly
- D) beetle

57. In order to avoid accidents at night, one should wear _____ clothes when walking near the road.

- A) bright
- B) warm
- C) black
- D) tight

58. The disease likely to be caused by smoking is called _____.

- A) typhoid
- B) lung cancer
- C) polio
- D) cholera

59. One of the following diseases is a lung disease.

- A) Kwashiorkor
- B) Marasmus
- C) Tuberculosis (TB)
- D) Diarrhoea

60. Which of the following sentences about tight fitting clothes is true?

- A) They help stale air around the body to escape.
- B) It is healthier to wear them.
- C) They are more comfortable.
- D) They prevent the flow of blood through the skin.

61. The embroidery below shows a _____ stitch

- A) feather
- B) blanket
- C) decorative
- D) chain



62. For cutting cloths we should use a _____.

- A) thimble
- B) pair of scissors
- C) tape measure
- D) needle

63. Mother's milk is a perfect food for _____.
- A) babies
 - B) grandmothers
 - C) grandfathers
 - D) girls
64. These are the good sources of energy.
- A) peas, cabbage, carrots
 - B) apples, bananas, oranges
 - C) bread, samp, sugar
 - D) bread, apples, carrots
65. To protect our bodies from heat and cold, we have to wear _____.
- A) clothes
 - B) sacks
 - C) leaves
 - D) shoes
66. The best water for washing clothes is _____ water.
- A) hard
 - B) greasy
 - C) muddy
 - D) warm
67. Which animals kill rats and mice in the store rooms?
- A) Dogs
 - B) Cats
 - C) Hens
 - D) Pigs
68. _____ are a good source of vitamin C.
- A) Eggs
 - B) Cakes
 - C) Oranges
 - D) Onions
69. When frying an egg one should use _____.
- A) vinegar
 - B) water
 - C) fat
 - D) sauce
70. Which article is best for cleaning classroom chalk board.
- A) hand
 - B) broom
 - C) grass
 - D) duster

3.4. Malawi

3.4.1. Overview

End of Primary School Examination

1. Tide of examination:	Primary School Leaving Certificate Examination (PSLCE)
2. Amount of fees charged:	Nil
3. Examination after years in primary school (6, 7, 8 years):	8 yrs
4. Children's entry age in primary school:	6 yrs
5. Number of pupils sitting examination in 1994:	103,833
6. Examination subjects offered:	<p>11 subjects in 8 papers:</p> <ul style="list-style-type: none">• English• Arithmetic• General Knowledge (Geography, History, Civics)• Chichewa• Agriculture• Science & Health Education• Home Science• Needle Craft <p>The last three subjects are optional. Candidates are required to choose anyone. In practice boys opt for Science & Health Education, girls choose between Home Science and Needle Craft. Each candidate therefore covers 6 subjects which all must be passed to qualify for the PSLCE.</p> <p>Note: From 1995 on the former 11 examination subjects are offered in 7 papers:</p> <ul style="list-style-type: none">• English (Paper I Composition, Paper II Grammar, Structure, Comprehension)• Chichewa (Paper I Composition, Paper II Grammar, Comprehension)• Arithmetic• General Paper (History, Geography, Civics)• Science (incl. Agriculture and Health Education)• Home Economics• Needle Craft <p>The papers in subjects 1-4 are compulsory. One additional optional paper out of 5-7 is further needed.</p>
7. Language of examination:	English (except for the national/local language paper)

8. Institution setting the examination questions:	Malawi National Examinations Board (MANEB)
9. Have there been any reforms in the examination questions?	Yes
When? (year)	1991 and 1995
What kind?	Deliberate introduction of items testing higher cognitive skills (1991). Introduction of Multiple-Choice Test Items (1995).
10. Stages of development of examination questions (please describe):	<ul style="list-style-type: none"> • Appointment of chief examiners or setters. • Drafting of examination papers. • Typing of drafted examination papers. • Moderation of examination papers by panels. • Typing and proofreading of final examination papers.
11. Type of examination questions and distribution of different kind of questions.	No multiple-choice questions but mostly structured and essays. Composition: 50% recall, 50% application and higher order. However, note the changes since 1995.
12. Is continuous assessment incorporated in the final examination?	Yes [] No [x]
13. Are examination items pretested?	Yes [] No [x]
14. Which professional groups are involved in setting the examination questions?	<ul style="list-style-type: none"> • Secondary school teachers • School inspectors • Tutors of TTCs • Curriculum developers
15. Are the same professionals who set the examination questions involved in marking papers?	Yes [x] but in the capacity of team leaders, the markers being primary school teachers. No []
16. How are examination results used for improving teaching in primary schools?	Chief examiners' reports which analyse examination are issued to schools.
17. To what other uses are the examination results put?	For selection to secondary school.
18. Main problem with Primary School Leaving Examinations?	Very competitive, to the extent that they guide the curriculum and promote cheating especially in the schools. There is also the problem of repetition at standard 8.

3.4.2. Innovations in Primary School Leaving Certificate Examinations (PSLCE) in Malawi and Overview of the 1993 Results

by Jacob Mwanza, Malawi National Examinations Board

Introduction

A consultancy report in 1987 by H.C.A. Somerset had pointed out that PSLCE and Junior Certificate Examinations (JCE), and PSLCE in particular, tended to test simple factual recall at the expense of more important cognitive skills such as comprehension, application and reasoning. Recall type of questions were found to be predominant especially in Science, History, Geography, and Agriculture. Further, candidates are usually asked to recall a single isolated fact: a name, a date or a place. Questions which probe understanding of causes or reasons are much less common. The questions ask »who«, »when«, »what« or »where«, rather than »why« or »how« (Somerset 1987).

These findings were confirmed by a research study in 1988 carried out by the Malawi National Examinations Board (MANEB). This study also indicated that sampling of content tended to be unbalanced in some subjects of the PSLCE.

Somerset gives the following examples picked from past examination papers to illustrate his point:

1. Mention the four types of bollworm that attack cotton.
2. Name the branch of Agriculture that a farmer practises when he grows
 - a) Cabbages.
 - b) Bluegum or Eucalyptus.
 - c) Millet or Maize.
 - d) Hibiscus flowers.

(1986 Agriculture)

3. Name the type of ship that carries
 - a) oil.
 - b) people.
4. Name two ways by which people in USA earn their living.
5. Which two countries in Africa are leading producers of copper?
6. Mention the two types of coffee grown in Tanzania.

Partly in the light of these findings, a contract for a Test Development Specialist (TDS) was arranged by the Malawi National Examinations Board (MANEB) in conjunction with the Ministry of Education and Culture (MOEC). The contract was managed by the British Council and funded by the World Bank through the 5th Education Sector Credit for the period 10 March 1989 to 10 March 1991.

Among the TDS's terms of reference were the following:

Purpose: Improve the Malawi Examination Systems

Main Duties:

- be responsible for the development of examinations at the Primary School Leaving

Certificate Examination, Junior Certificate Examination and Malawi School Certificate of Education levels;

- be responsible for curriculum development and construction and developing essay and objective examinations. Besides he will be responsible for pre-testing the items in Secondary Schools, Primary Schools and Teachers' Colleges;
- organise and conduct item writing workshops;
- train examiners in both essay and objective tests;
- establish and construct the blueprint for use by the examiners in both essay and objective tests;
- help determine the skills to be tested in each subject area. That is, determine the percentage of each skill to be tested in each subject area.

Primary School Examinations

Malawi has an 8-4-4 education system, which implies that pupils spend at least eight years in primary school before they can go to secondary school, if at all.

PSLCE have undergone major improvements in Malawi. In 1989 a workshop for chief examiners and moderators was held. The workshop exposed participants to principles of examining and to ways of devising questions which test higher cognitive abilities.

In five subjects which had tested mainly recall - Agriculture, General Paper (Geography, History and Civics), Science and Health Education, Home Economics, and Needle Craft - complete papers were eventually produced by workshop participants and MANEB staff.

Prior to pre-testing the papers, sets of specimen papers were issued to schools in May 1990 with notice that changes in examination questions would be effected for the first time in July 1991. Another innovation was the conversion of all the papers to answer booklet form. This enables candidates to write their answers in spaces next to the questions on the paper. It has the advantage of being easier for candidates to handle and for examiners to mark, and of reducing the amount of loose paper which MANEB has to issue to schools.

In July 1990 the papers were pre-tested. A sampling framework was devised by finding the pass rate in the 1989 examinations for each of the 24 districts in the country and then choosing a school from each district of an appropriate size with a pass rate similar to that of its district. Each school was asked to enter candidates for two out of the three subjects Agriculture, General Paper, and Science/Health Education, according to an overlapping pair design. The subjects Home Economics and Needle Craft were also pretested in those of the sample schools which offered them as options. Arithmetic, Chichewa and English were not pre-tested as the style of questioning in the new papers differed little from that in use.

Candidates' Performance in Pre-Tests

Pre-test papers were marked by chief and senior examiners during July and August 1990. At the end of marking, the examiners were interviewed for their impressions of how the questions had behaved. In general, their impressions were favourable with none thinking that the papers were far too difficult for the candidates.

The subsequent statistical item analysis confirmed the examiners' impressions. Also the marks which the candidates were given on the pre-test papers compared favourably with those on the real PSLCE although all pre-test papers were found to be more difficult, but not by such a wide margin.

The new-format examination has been in operation since 1991 and what needs to be done is to follow it up and reinforce it, preferably by holding workshops for examiners to review the

results of the first new examinations and for teachers to ensure that the aims of the reforms are understood.

Use of Multiple-Choice Items for PSLCE

MANEB has been encouraged by the World Bank to use multiple-choice items in some subjects of the PSLCE. With increasing numbers of candidates, this would speed up marking and increase the reliability of the examinations. Multiple-choice testing is not new to Malawi at the primary school level. It was in use until about 20 years ago, when it was abolished, probably because of its restrictive effect on the development of pupils' power of expression. Plans, however, are under way for the introduction of multiple-choice testing of the 1995 PSLCE. During the months of June and July 1992, MANEB pre-tested multiple-choice papers at a sample of schools throughout the country in Science and Health Education, Agriculture and General Paper.

The 1993 Primary School Leaving Certificate Examinations

In 1993 the total numbers of pupils in class 8 was 96,434 and of these 63,771 were boys and 32,663 were girls, or 66.13% boys and 33.87% girls which means education is more accessible to boys than to girls. The number of pupils who passed the examination was 60,418 which represents a percentage pass of 62.65. The number of boys who passed the examination was 42,341 (66.40%) and the number of girls was 18,077 (55.34%). The table below compares the performance of boys and girls within the 28 education districts in Malawi.

District	Total Entry (Girls)	No. of Girls Passing	Total Entry (Boys)	No. of Boys Passing
Chitipa	1,164	716 (61.5%)	2,406	1,725 (71.70%)
Karonga	774	562 (72.61%)	1,793	1,317 (73.45%)
Nkhata Bay	938	592 (63.11%)	2,055	1,452 (70.66%)
Rumphi	1,210	733 (60.58%)	2,101	1,440 (68.54%)
Mzimba	3,332	1,760 (52.82%)	6,679	4,206 (62.97%)
Kasungu	1,107	796 (71.91%)	2,068	1,562 (75.53%)
Nkhotakota	626	391 (62.46%)	1,406	978 (69.56%)
Ntchisi	588	376 (63.95%)	946	672 (71.04%)
Dowa	990	608 (61.41%)	2,273	1,602 (70.48%)
Salima	577	394 (68.28%)	1,520	1,168 (76.84%)
Lilongwe	1,936	1,158 (59.81%)	3,954	2,828 (71.83%)
Mchinji	623	392 (62.92%)	1,309	1,002 (76.55%)
Dedza	838	374 (44.63%)	1,788	1,123 (62.81%)
Ntcheu	1,203	622 (51.70%)	2,277	1,430 (62.85%)
Mangochi	791	459 (58.03%)	2,011	1,415 (70.36%)
Machinga	1,047	517 (49.38%)	2,040	1,296 (63.53%)
Zomba	1,586	687 (43.32%)	3,366	2,087 (62.00%)
Chiradzulu	1,029	489 (47.52%)	1,784	1,084 (60.76%)
Blantyre	1,199	477 (39.78%)	2,279	1,206 (52.92%)
Thyolo	1,403	793 (56.52%)	2,770	2,770 (73.39%)
Mulanje	1,874	885 (47.23%)	3,643	2,332 (64.04%)
Chikwawa	561	275 (49.02%)	1,696	955 (56.31%)
Nsanje	407	301 (73.96%)	1,061	849 (80.02%)
Mwanza	409	261 (63.81%)	794	525 (66.12%)
Blantyre City	3,258	1,204 (36.96%)	4,765	2,406 (50.49%)
Lilongwe City	1,872	1,281 (68.43%)	3,019	2,183 (72.31%)
Mzuzu City	625	506 (80.96%)	879	706 (80.32%)
Zomba Urban	667	454 (68.07%)	1,039	716 (68.91%)

What is clearly discernible from the table I is that, except for Mzuzu City, girls' performance

(% pass) was lower in all districts than that of boys in the 1993 PSLCE. The underachievement of girls is scantily documented in Malawi although it is common knowledge that girls do not perform as well as boys. But the fact that girls achieved less than boys nationwide in this examination (perhaps the trend is the same in earlier years) should be cause of concern. What is strange too about these results is that the percentage pass of both girls and boys is lowest in the biggest City of Blantyre (39.96% girls and 50.49% boys). Research in Malawi on the secondary school leaving examinations indicates that urban schools do better than rural schools, especially in science subjects. One would have expected a similar result at the primary school level.

Malawi is divided into three administrative regions, the Northern region, Central region and the Southern region. Although the country is so divided for administrative reasons, there are marked differences between the regions. The Northern region, for example, has one dominant language which is different from the one largely spoken in the South and Centre; and the people's customs in the Centre and South are, generally, different. There are, of course, other differences within the regions e.g. prevalence of several dialects and customs, but generally differences are more marked between regions. Nationwide all schools take the same examination on similar days and times. Because of the influence of such factors as catchment area, test bias, etc. on achievement, it becomes important to study pupils' achievement in different localities and hence attempt to see whether pass rates in different regions of the country are the same or not and why, if different, especially where the examination is the same.

Some research at the school leaving level indicates differential student achievement between the regions in some subjects. Table II shows that the percentage of pupils who passed the 1993 PSLCE in the Southern region of both girls and boys is lower than that of the Centre and North.

Region	% Pass Girls	% Pass Boys
South	47.80	62.04
Centre	61.70	70.81
North	60.54	68.16

The percentage of girls passing the 1993 PSLCE is lower than that of boys in all the regions and is lowest in the Southern region. The differences in the pass rates of girls in the North and Centre were marginal and so were the differences in the pass rates for the boys in the same regions. The reasons for these anomalies/similarities can only be entangled through indepth research.

Subject	\bar{X}	SD	Mode	Median Mark
Science and Health Education	56.76	20.17	70	59
Arithmetic	57.92	23.50	73	60
General Paper	59.43	20.01	74	62
Agriculture	61.41	19.00	75	63
English	61.12	19.04	70	63
Needle Craft	71.67	11.94	76	73
Housecraft	73.47	12.47	75	75
Chichewa	75.19	12.27	78	77

The statistics on table III indicate that Science and Health Education was most difficult in the 1993 PSLCE followed by Arithmetic and General Paper (note the low means, large SDs and low median marks). The easiest subject was Chichewa (the national language) then Housecraft followed by Needle Craft. English and Agriculture were of the same difficulty. Arithmetic had the largest standard deviation implying that the dispersion of scores was widest while Needle Craft had the lowest followed by Chichewa and Housecraft. Arranged in order of difficulty with the most difficult first, they rank as follows:

1. Science & Health Education
2. Arithmetic
3. General Paper
4. Agriculture
5. English
6. Needle Craft
7. Housecraft
8. Chichewa

Science subjects therefore, except Agriculture, were the most difficult (i.e. Science and Health Education - $\bar{X} = 56.76$ and Arithmetic - $\bar{X} = 57.92$). This is not a surprising result. Our schools have problems imparting scientific knowledge either because of poor tuition, student anxiety or some other unknown factors.

These discussions, however, should be treated with caution not only because they are based on aggregated data but also because pupil background factors as well as school factors have not been accounted for in the analyses.

Note: From 1995 on the PSLCE has been changed in format and method. With the exception of the language paper in Chichewa and English who are each split into two papers (Composition and Multiple-Choice answers) all other papers use multiple-choice questions only.

3.4.3. 1995 Primary School Leaving Certificate Examinations/Science Incorporated Paper

THE MALAWI NATIONAL EXAMINATIONS BOARD

1995 PRIMARY SCHOOL LEAVING CERTIFICATE EXAMINATION

SCIENCE INCORPORATED

Subject Number: P192

Tuesday, 18 July

**Time Allowed: 1 ½ hours
1.30 - 3.00 pm**

Name of Candidate: _____

Name of School: _____

Examination Number: _____

INSTRUCTIONS

1. **This paper contains 12 pages. Please check.**
2. Answer **all** questions. Write your answers on the separate **answer sheet** provided.
3. There are 70 questions in this paper.

4. IMPORTANT

Please hand over your computer answer sheet to the Invigilator: **DO NOT FOLD THE COMPUTER ANSWER SHEET.**

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Because of the recent changes we have included the 1995 examination paper, now called

Section A (25 marks)

AGRICULTURE

1. To which branch of Agriculture does the growing of cauliflower belong?
 - A. Floriculture
 - B. Olericulture
 - C. Arboriculture
 - D. Silviculture

2. Which of the following practices can control rosette in groundnuts?
 - (1) early planting
 - (2) correct plant spacing
 - (3) planting resistant varieties
 - A. (1) and (2) only
 - B. (1) and (3) only
 - C. (2) and (3) only
 - D. (1), (2) and (3)

3. One advantage that indigenous cattle have over cattle introduced into this country from temperate countries is that indigenous cattle
 - A. grow faster.
 - B. are more tolerant to drought.
 - C. have longer horns.
 - D. produce more milk.

4. Which centre of early civilization used the source of power shown in **Figure 1** below?

- A. Egypt
- B. India
- C. Mesopotamia
- D. China



5. In an experiment, pupils applied 15 kg of UREA fertilizer to a one hectare plot of maize. In another hectare plot of maize they applied 15 kg of CAN fertilizer. In both plots all recommended production practices were followed. What might have been the objective of the experiment?
 - A. to find out the type of fertilizer that gives the best yield
 - B. to find out the amount of fertilizer that gives the best yield
 - C. to find out if following recommended production practices improves yield
 - D. to find out if application of fertilizer is necessary in maize growing

6. Why is it advisable to grow different types of crops on a farm?

- A. to earn more money during marketing
- B. to reduce the danger of total crop failure in times of low rainfall
- C. to have enough to eat and surplus to sell to others
- D. to be self reliant on crop production

7. Which of the following are advantages of crop rotation?

- (1) It helps to maintain soil fertility.
- (2) It helps to reduce labour.
- (3) It helps to control diseases and pests.

- A. (1) and (2) only
- B. (2) and (3) only
- C. (1) and (3) only
- D. (1), (2) and (3)

8. Name the cheapest system of keeping chickens.

- A. deep litter system
- B. semi-intensive system
- C. free range system
- D. battery cage system

9. **STATEMENT**

Pruning is one of the recommended practices in tree growing

REASON

it protects trees from diseases and pests.

BECAUSE

- A. The statement is true but the reason is false.
- B. The statement is false but the reason is a true fact.
- C. Both the statement and reason are true and the reason is a correct explanation of the statement.
- D. Both the statement and the reason are true but the reason is not a correct explanation of the statement.

10. A farmer bought 10 bags of fertilizer at K30 each, maize seed at K20 and paid K40 for labour. He harvested 20 bags of maize which he sold at K25 each. How much profit did he make?

- A. K500
- B. K220
- C. K180
- D. K140

11. **Figure 2** is a diagram of a cow.

Which of the following things can be made from the part of a cow labelled X?

- A. brushes
- B. buttons
- C. shoes
- D. bags

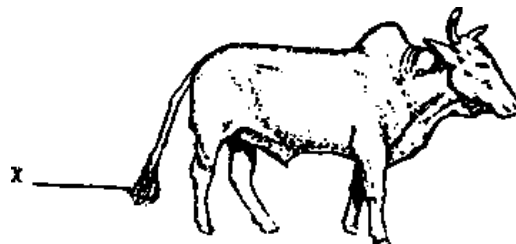


Figure 2

12. Which of the following practices can prevent egg-eating in a flock of layers kept in a deep litter system?

- (1) allowing adequate ventilation in the room
- (2) debeaking the layers
- (3) providing more calcium in the feed

- A. (1) and (2) only
- B. (1) and (3) only
- C. (2) and (3) only
- D. (1), (2) and (3)

13. What should a fish farmer do if he observes black foul looking water in his fish pond?

- A. He should stop feeding the fish.
- B. He should harvest the fish.
- C. He should apply fertilizer to the pond.
- D. He should supply the fish with more food.

14. If Chitembana groundnut seed costs K4.20 per kilogram, and the seedrate for Chitembana groundnuts is 100 kg per hectare. What would be the cost of seed for 500 square metres? (1 hectare = 10,000 m²).

- A. K21
- B. K210
- C. K420
- D. K2100

15. Which of the following fruits is **not** correctly matched with its method of propagation?

- A. oranges budding
- B. pawpaw seeds
- C. apples grafting
- D. banana layering

16. In animal husbandry the purpose of vaccinating animals is to

- A. eradicate animal parasites.
- B. control outbreak of diseases.
- C. control internal parasites.
- D. ensure high quality breeds.

17. Commercial farming is **best** described as the production of

- A. hybrid crops and animals.
- B. crops and animals to satisfy one's needs.
- C. crops and animals for sale-
- D. crops mainly for food and animals mainly for sale.

18. Which of the following is a list of storage pests only?

- A. stalk borer, beetles, giant loopers
- B. armyworm, locust, mealy bug
- C. weevil, moth, rat
- D. moth, aphids, mite

19. Name a natural resource which plants need to manufacture their food and is also a source of Vitamin D.

- A. air
- B. sunlight
- C. water
- D. soil

20. The **best** time to apply farmyard manure and compost manure in a maize garden is

- A. when maize is about to tassel.
- B. when maize is about knee high.
- C. soon after germination.
- D. before planting.

21. In an experiment pupils put some soil in a glass jar. They poured some water into the jar. The soil and water were shaken together. The mixture was allowed to settle. The diagram in **Figure 3** below shows the components seen through the glass.

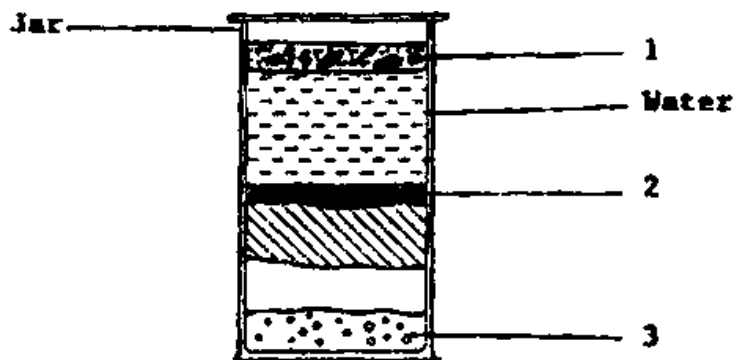


Figure 3

The numbered layers are likely to be

- | 1 | 2 | 3 |
|----------------------------|-------------------------|-------------------------|
| A. floating organic matter | sand | gravel |
| B. gravel | floating organic matter | sand |
| C. floating organic matter | clay | gravel |
| D. silt | gravel | floating organic matter |

22. Soil erosion may be prevented by

- A. ridging across the slope.
- B. practicing mixed farming.
- C. early land preparation.
- D. burning crops attacked by diseases.

23. Which of the following explains how early planting of maize gives high yields?

- (1) The growing plants make full use of rainfall and plant food.
- (2) The farmer has enough time to do other things apart from caring for maize.
- (3) The plants escape some of the attacks by diseases and pests.

- A. (1) and (2) only
- B. (1) and (3) only
- C. (2) and (3) only
- D. (1), (2) and (3)

24. One of the methods of controlling foot and mouth disease of cattle is by

- A. dipping the animals regularly.
- B. vaccinating all the animals.
- C. vaccinating the infected animals.
- D. providing adequate spacing for the animals.

25. The diagrams in **Figure 4** below show some examples of vegetables.

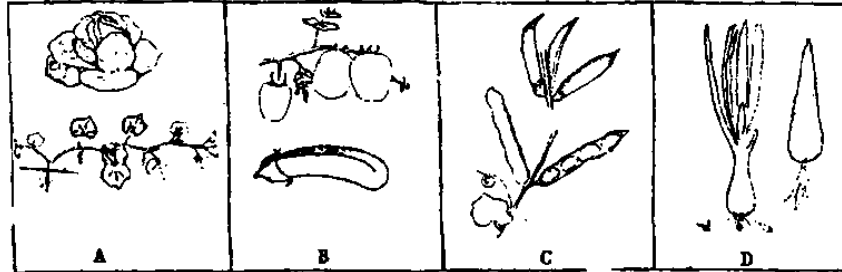


Figure 4

Which is a leguminous group?

Section B

SCIENCE (30 marks)

26. **Two** necessary conditions for a rainbow to form are

- A. sunlight and humidity.
- B. sunlight and raindrops.
- C. clouds and sunlight.
- D. raindrops and clouds.

Figure 5 is a **chart** showing recordings of wind direction. Use it to answer questions **27** and **28**.

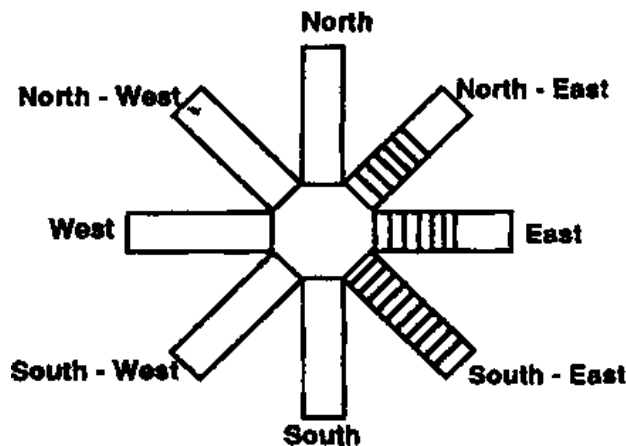


Figure 5

27. What is the name of this chart?

- A. wind rose
- B. wind vane
- C. wind gauge (anemometer)
- D. windsock

28. According to the chart, from which direction does the wind mostly come?

- A. North-East
- B. East
- C. South-East
- D. South

29. Which of the following liquids will conduct electricity?

- (1) salt solution
 - (2) sugar solution
 - (3) soap solution
- A. (1) and (2) only
 - B. (1) and (3) only
 - C. (2) and (3) only
 - D. (1), (2) and (3)

Study the **table** below and use it to answer questions **30** and **31**.

Planet	Distance from the Sun	Time for one trip round the sun
X	58 million kilometres	88 days
Venus	108 million kilometres	225 days
Earth	150 million kilometres	1 year
Jupiter	780 million kilometres	12 years
Uranus	2870 million kilometres	84 years
Neptune	4500 million kilometres	165 years

30. What is the name of the planet represented by letter X?

- A. Mercury
- B. Pluto
- C. Saturn
- D. Mars

31. There is another planet not shown in the table. It is 1430 million kilometres from the sun. About how long will it take this planet to make one trip round the sun?

- A. 10 years
- B. 30 years
- C. 100 years
- D. 250 years

32. The diagrams in **Figure 6** show simple electric circuits. When a bulb and battery are connected by wires as shown in **Figure 6a** the bulb lights.

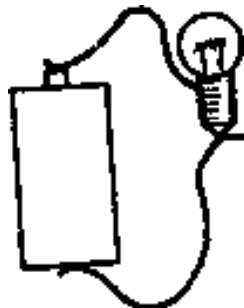


Figure 6a

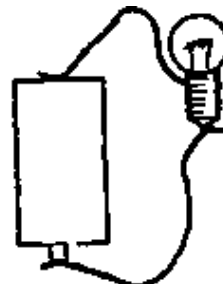






Figure 6b

What would happen if the battery is reversed as in **Figure 6b**?

- A. The bulb will be brighter than in **Figure 6a**.
- B. The bulb will be less bright than in **Figure 6a**.
- C. The bulb will light as bright as in **Figure 6a**.
- D. The bulb will not light.

33. A guitar has strings arranged as shown below. The strings are equally tight.

Which string will produce the lowest sound when plucked?

- A. 
- B. 
- C. 
- D. 

34.

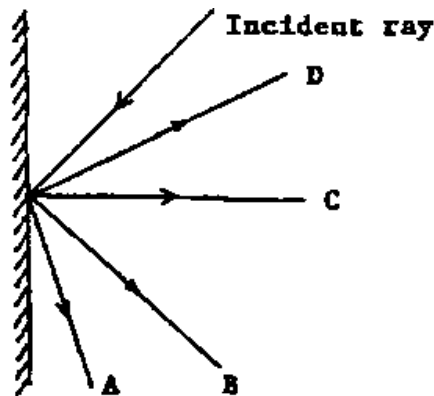


Figure 7

The diagram in **Figure 7** above shows an incident ray of light and four other rays labelled **A**, **B**, **C** and **D**. Which of the four rays is reflected from the incident ray?

35. Why are telephone wires tied loosely between telephone poles?

- A. to allow the smooth passing of sound
- B. to give room for the contraction and expansion of wire
- C. to give room for vibrations inside the wire
- D. to avoid wire breakage when a pole falls

The diagram in **Figure 8** shows how matter changes from one state to another due to heating or cooling. Use it to answer questions 36 and 37.

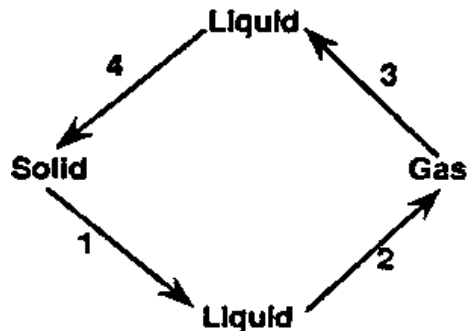


Figure 8

36. Which number represents the process of evaporation?

- A. 1
- B. 2
- C. 3
- D. 4

37. Which **two** numbers represent change of state resulting from cooling of the substance?

- A. 1 and 2
- B. 2 and 3
- C. 3 and 4
- D. 1 and 4

38. Where in a plant does most transpiration take place?

- A. leaves
- B. roots
- C. stems
- D. Flowers

39. The diagram in **Figure 9** below shows a balance with a 2 kg mass placed at 6 cm away from the balancing point.

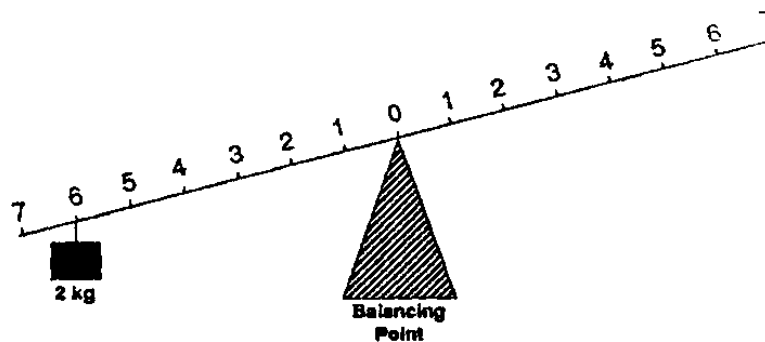


Figure 9

Where on the other side would you place a 4 kg mass in order to balance?

- A. 2 cm away from the balancing point
- B. 3 cm away from the balancing point
- C. 4 cm away from the balancing point
- D. 6 cm away from the balancing point

Study the diagram of a food web in **Figure 10** below and use it to answer questions **40** and **41**.

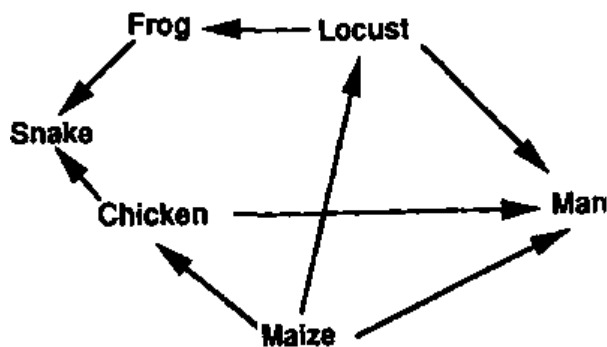


Figure 10

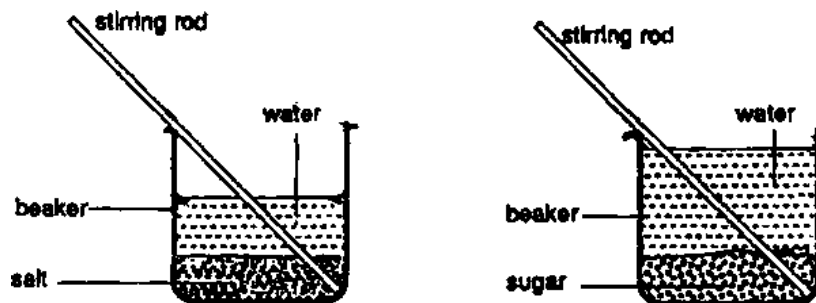
40. Name the producer.

- A. maize
- B. man
- C. locust
- D. Chicken

41. Which of the following food chains is correctly represented in the food web?

- A. locust \Rightarrow maize \Rightarrow man \Rightarrow frog
- B. maize \Rightarrow chicken \Rightarrow locust \Rightarrow man
- C. locust \Rightarrow chicken \Rightarrow snake \Rightarrow frog
- D. maize \Rightarrow locust \Rightarrow frog \Rightarrow snake

42. Mary wanted to find out if sugar dissolves in water just as quickly as salt. She put two spoonfuls of sugar in a glass of water. She also put two spoonfuls of salt in another glass of water as shown in **Figure 11**. She stirred the two solutions slowly and timed how long it took the sugar and salt to disappear.



What should Mary have done to get accurate results?

- A. She should have used equal volumes of water.
- B. She should have used the same container.
- C. She should have used hot water.
- D. She should have stirred quickly.

43. In a simple cell, zinc and copper plates are called

- A. positive poles.
- B. negative poles.
- C. electrolytes.
- D. electrodes.

44. In **Figure 12** below are drawings of two measuring cylinders. **Cylinder 1** contains water as shown. When a stone is dropped in it the water level rises to a level as shown in **cylinder 2**. (1 ml = 1 cm³)

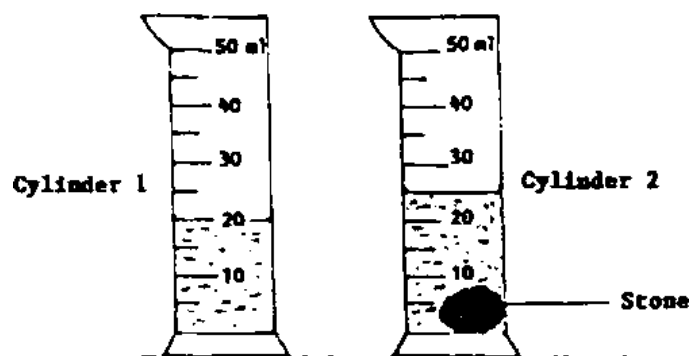


Figure 12

What is the volume of the stone?

- A. 1 cm³
- B. 5 cm³
- C. 20 cm³
- D. 25 cm³

45. The diagram in **Figure 13** below shows a column of water trapped in a glass tube.

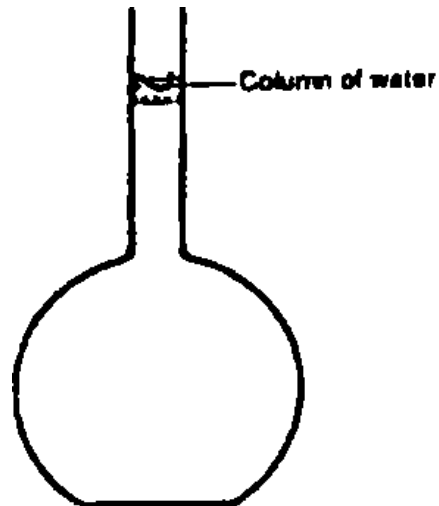


Figure 13

Why does the column of water rise on gentle heating?

- A. Air inside the glass tube expands more than water.
- B. Air can take the place of liquids when there is heat.
- C. The heat pushes the column of water up.
- D. Air expands when heated and pushes the water column up.

46. **Figure 14** shows four types of non-flowering plants labelled **A**, **B**, **C** and **D**.

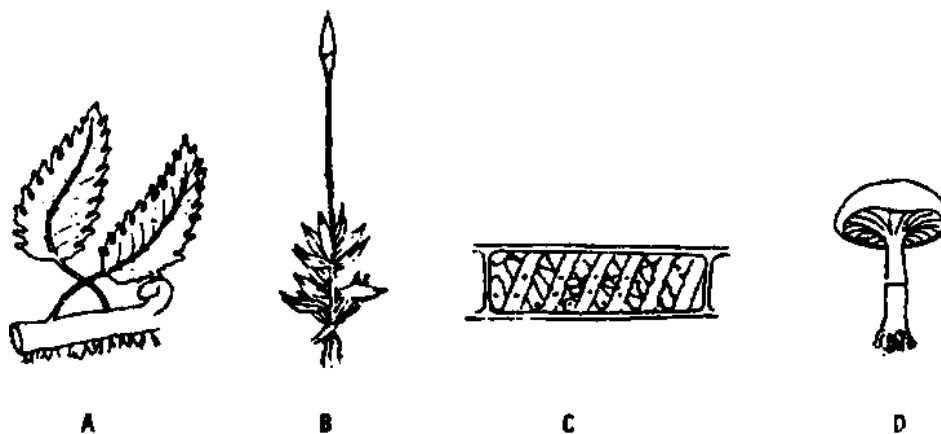


Figure 14

Which **one** does **not** manufacture its own food?

47. Substances which allow light to pass through are said to be

- A. luminous.
- B. spectrum.
- C. transparent.
- D. opaque.

Figure 15 is a diagram of a water cycle. Study it and answer questions 48 and 49.

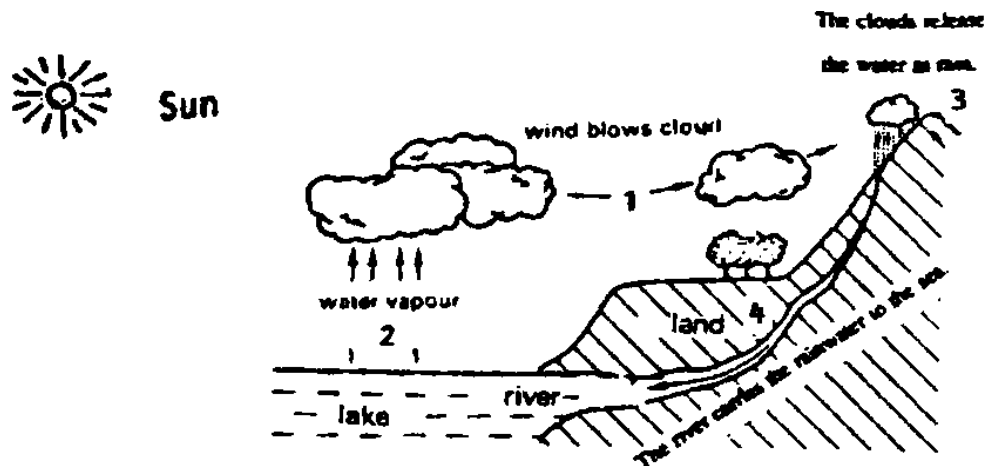


Figure 15

48. What is the importance of the sun in the cycle?

- A. It is required in rainbow formation.
- B. It provides heat which causes water to evaporate.
- C. It is necessary in the formation of clouds.
- D. It makes the water vapour to condense.

49. Which of the following is the correct order for the cycle

- A. 1 ⇒ 2 ⇒ 3 ⇒ 4
- B. 2 ⇒ 1 ⇒ 3 ⇒ 4
- C. 4 ⇒ 1 ⇒ 2 ⇒ 3
- D. 4 ⇒ 3 ⇒ 2 ⇒ 1

50. Which of the following is **not** a mammal?

- A. whale
- B. pigeon
- C. bat
- D. cow

51.



Figure 16

When the sun, the moon and the earth are in line as shown in **Figure 16** above, which of the following happens?

- A. An eclipse of the sun happens.
- B. An eclipse of the moon happens.
- C. An eclipse of the earth happens.
- D. A lunar-solar eclipse happens.

52. The rotten remains of dead animals and plants in the soil are called

- A. loam
- B. clay.
- C. humus.
- D. sand.

53. The diagrams in **Figure 17** below show two beakers filled with two different liquids, X and Y.

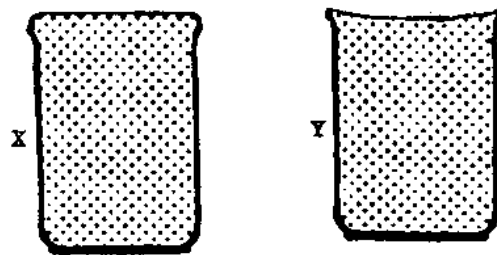


Figure 17

Which of the following statements about the two liquids are true?

- (1) Particles of **X** hold each other more strongly than particles of **Y**.
- (2) particles of **Y** hold each other more strongly than particles of **X**.
- (3) **X** has a bigger drop size than **Y**.
- (4) **Y** has a bigger drop size than **X**.

- A. (1) and (2) only
- B. (1) and (3) only
- C. (1) and (4) only
- D. (2) and (4) only

Figure 18 below shows the path of food through the body. Study it and use it to answer questions **54** and **55**.

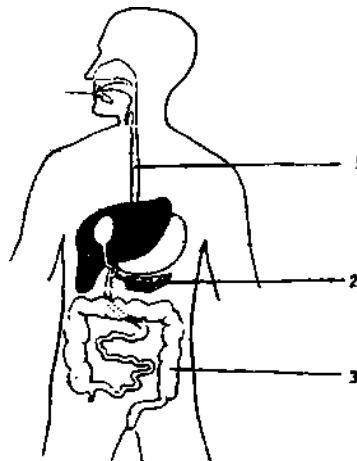


Figure 18

54. The parts labelled 1 and 3 are

- | | | |
|----|------------------|------------------|
| | 1 | 3 |
| A. | gullet | stomach |
| B. | gullet | large intestines |
| C. | small intestines | large intestines |
| D. | email intestines | stomach |

55. Name a fluid produced in the part labelled 2.

- A. pancreatic juice
- B. bile
- C. saliva
- D. gastric juice

Section C (15 marks)

HEALTH EDUCATION

56. Which of the following diseases can be caused by careless disposal of human excreta?

- A. malaria
- B. common cold
- C. dysentery
- D. Marasmus

57. The first aid to be given to a person bitten by a dog is to

- A. tie with a cloth just above the bitten part.
- B. wash the bitten part with soap and water.
- C. cover up the wound with a dressing.
- D. take the patient to the hospital.

58. **Figure 19** is a bar chart showing the relationship between smoking habits and the number of lung cancer patients. Use it to answer questions **58** and **59**.

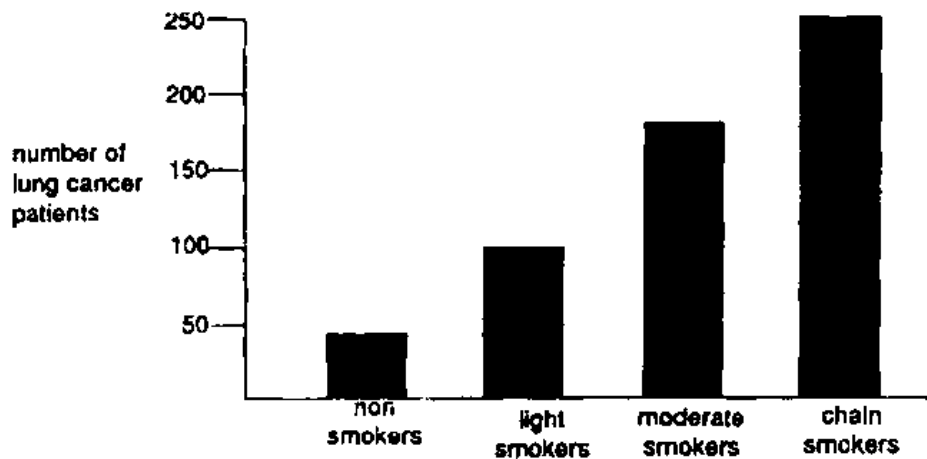


Figure 19

Which group has the lowest danger of suffering from lung cancer?

- A. chain smokers
- B. moderate smokers
- C. light smokers
- D. non-smokers

59. Which of the following statements is true?
- A. Only smokers can suffer from lung cancer.
 - B. Smoking increases the danger of suffering from lung cancer.
 - C. Both smokers and non-smokers have equal chance of suffering from lung cancer.
 - D. Non-smokers can never suffer from lung cancer.
60. At the water works why is alum added to water?
- A. to filter the water
 - B. to stick together pieces of mud
 - C. to kill germs
 - D. to dissolve unwanted particles
61. One of the advantages of the under-five clinic is that it allows
- A. babies to eat balanced meals.
 - B. expectant mothers to learn baby care.
 - C. babies to be vaccinated against childhood diseases.
 - D. mothers to discuss baby care.
62. How is the malarial parasite transmitted to a new host?
- A. through body contact
 - B. through breathing
 - C. through eating poorly cooked food
 - D. through mosquito bite
63. Which of the following tissues join bones to muscles?
- A. cartilage
 - B. fat
 - C. ligament
 - D. tendon
64. The part of the ear that carries messages from the ear to the brain is the
- A. eardrum.
 - B. eustacian tube.
 - C. auditory nerve.
 - D. optic nerve.
65. **One** of the causes of anaemia is the deficiency of
- A. mineral iron.
 - B. mineral calcium.
 - C. vitamin C.
 - D. vitamin D.
66. What kind of fracture is shown in **Figure 20** below?

Figure 20



- A. complicated fracture
- B. simple fracture
- C. compound fracture
- D. greenstick fracture

67. The immunity that one gets after antibodies have been injected into the body is called

- A. inborn immunity.
- B. acquired active immunity.
- C. acquired passive immunity.
- D. natural immunity.

68. Which of the following happens when we do **not** do exercises?

- A. We become lonely.
- B. We get tired easily.
- C. We become weak.
- D. Our bones become soft.

69. At lunch Chifundo ate **nsima**, cabbage, an orange and cassava. The meal was not a balanced diet because it did not contain

- A. proteins..
- B. vitamins.
- C. carbohydrates.
- D. mineral salts.

70. Study the diagram in **Figure 21** below and answer the question that follows.

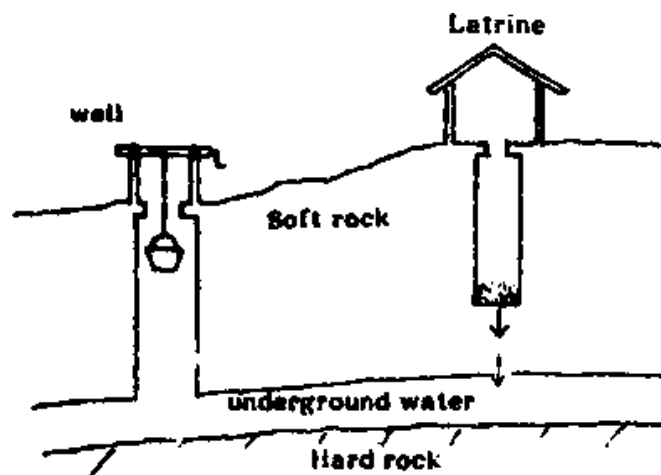


Figure 21

What is wrong with this set-up?

- A. The well can be contaminated.
- B. The latrine can fall into the well.
- C. The wind can blow bad smell from the latrine to the well.
- D. The latrine can be used by too many people coming to draw water.

END OF QUESTION PAPER

3.4.4. 1994 Primary School Leaving Certificate Examinations/Science and Health Incorporated Paper

THE MALAWI NATIONAL EXAMINATIONS BOARD
1994 PRIMARY SCHOOL LEAVING CERTIFICATE EXAMINATION
SCIENCE AND HEALTH EDUCATION

(100 marks)

Subject Number: P191

Wednesday, 13 July

Time Allowed: 2 hours
1.30 - 3.30 pm

Instructions:

1. This paper contains 16 pages. Please check.
2. Write the name of the **District** where you are writing the examination, **Centre Number** and your **Examination Number** on every sheet in the spaces provided.
3. Answer **all** questions. Write your answers in the spaces provided.
4. If you find any question too difficult, leave it and return to it later if you have time.
5. If you have any questions about these instructions, ask them now. You may not ask questions once the examination has begun.

DISTRICT

CENTRE NO.

EXAMINATION NO.

1994

P191

SCIENCE

1. a. What do we call water when it is in solid form?

_____ (1 mark)

- b. **Figure 1** is a diagram showing a saucer and a cup containing equal volumes of water.

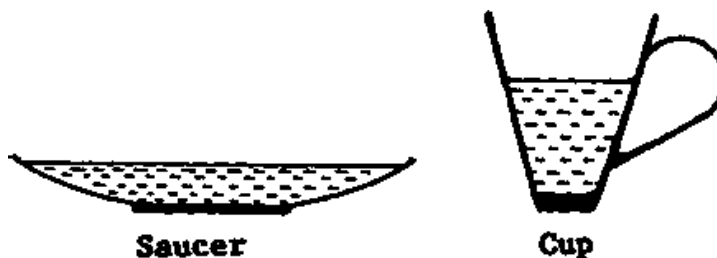


Figure 1

Suggest a reason why the water will evaporate faster from the saucer than from the cup.

_____ (1 mark)

2. Figure 2 is a diagram showing the result of mixing paraffin, water and cooking oil (covo) labelled **A**, **B** and **C** but not necessarily in that order.

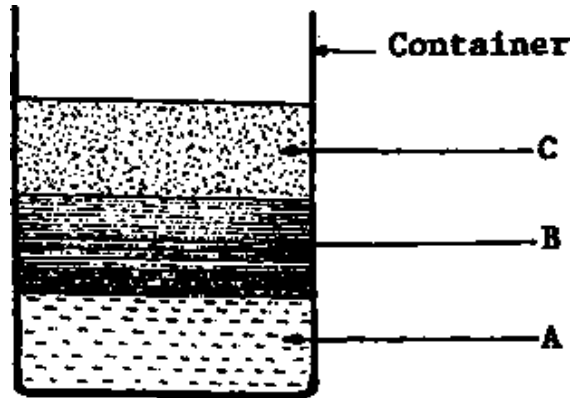


Figure 2

a. Which of these, **A**, **B** or **C** is paraffin?

_____ (1 mark)

b. Give a reason for your answer to 2a.

 _____ (1 mark)

3. If an axe with a wooden handle is left lying in the sun for some hours, the axe feels hot while the handle feels warm.

Suggest a reason for this difference.

 _____ (1 mark)

4. a. (i) Mention **one** type of mosquito.

_____ (1 mark)

(ii) What disease is transmitted by the type of mosquito you have mentioned in 4a (i)?

_____ (1 mark)

b. Give any **two** ways in which the number of mosquitoes in a given area can be reduced.

 _____ (2 marks)

c. What does an ant lion eat?

_____ (1 mark)

5. **Figure 3** is a diagram showing an empty plastic bottle **A** and the same bottle **B** when it is squeezed.

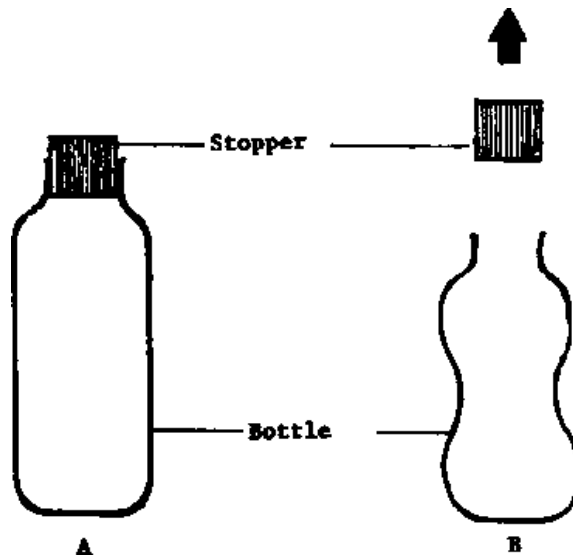


Figure 3

Why does the stopper in bottle B go out?

_____ (2 marks)

6. a. State **two** conditions that are necessary for the multiplication of bacteria.

_____ (2 marks)

b. In what **two** ways are bacteria important to man?

 _____ (2 marks)

7. a. What is the centre of the solar system?

_____ (1 mark)

b. Name the type of movement the earth makes which results into day and night.

_____ (1 mark)

c. Explain why the new moon is not visible.

_____ (1 mark)

d. Give **one reason** why life is impossible on the moon.

_____ (1 mark)

8. **Figure 4** is a diagram showing an Irish potato tuber that is beginning to grow:

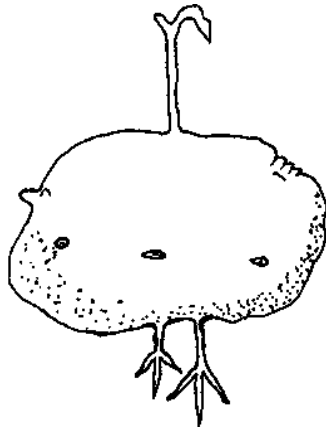


Figure 4

a. Name **two** features which show that the tuber is a stem.

_____ (2 marks)

b. What is the function of this type of stem?

_____ (1 mark)

9. a. Name the **two** parts which make up a stamen of a flower.

_____ (2 marks)

b. Maize is usually cross pollinated.

(i) What is cross pollination?

_____ (1 mark)

(ii) How are the chances of self pollination reduced in a maize plant?

_____ (1 mark)

10. a. What feature makes the toes of the hind legs of a frog similar to those of a duck?

_____ (1 mark)

b. What is the function of the feature you have mentioned in 10a?

_____ (1 mark)

11. The image of an object on the film in a pin-hole camera is upside down. What property of light does this show?

_____ (1 mark)

12. a. State **two** ways in which sounds differ.

_____ (2 marks)

b. **Figure 5** is a diagram of one of the musical instruments played in Malawi.

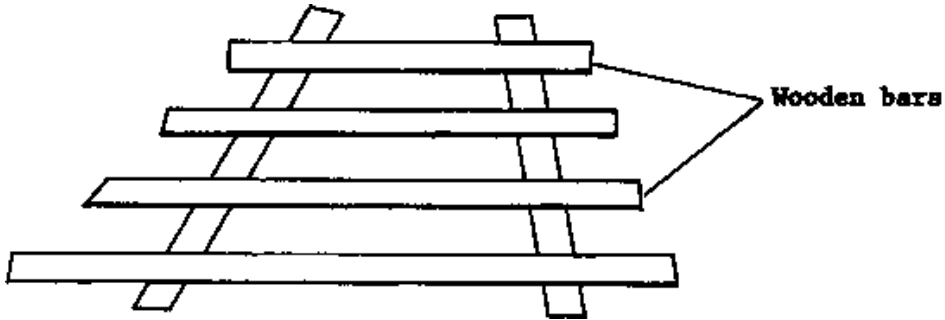


Figure 5

(i) What is the name of the instrument?

_____ (1 mark)

(ii) How is this instrument played?

_____ (1 mark)

13. a. Explain why mineral salts are easily washed away in sandy soil.

_____ (1 mark)

b. Mention **one** way in which earthworms are useful in the soil.

_____ (1 mark)

14. The **table** below shows readings on a wet and dry bulb thermometer taken from Monday to Friday.

	Mon	Tue	Wed	Thur	Frid
Dry Bulb	30°C	27°C	28°C	30°C	30.5°C
Wet Bulb	25°C	26°C	27.5°C	24.5°C	24°C

a. On which day was humidity lowest?

_____ (1 mark)

b. (i) On which day did it likely rain?

_____ (1 mark)

(ii) Give a reason for your answer to 14b (i).

_____ (1 mark)

15. Figure 6 is a diagram showing how living things depend on each other for food.

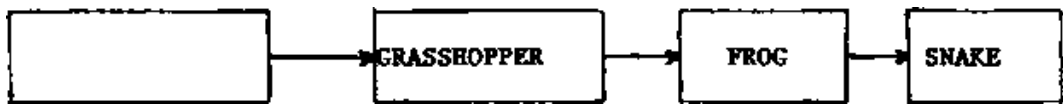


Figure 6

a. Complete the diagram by filling in the blank box. (1 mark)

b. What would happen to:

(i) the grasshoppers if all the frogs disappeared?

_____ (1 mark)

(ii) the organism you have mentioned in 15a if all the frogs disappeared?

_____ (1 mark)

c. Give a reason for your answer to 15b (ii).

 _____ (2 marks)

16. a. Mention **two** plants which can be grown using a stem.

 _____ (2 marks)

b. How does water from the ground get to all parts of the plant?

 _____ (2 marks)

17. **Figure 7** is a diagram showing a balancing beam.

4 bottle-tops of the same weight were placed on **side A**
 3 cm away from the centre.

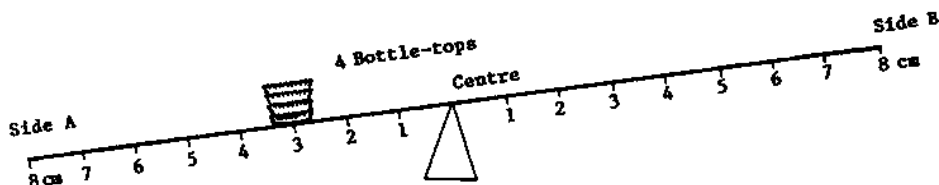


Figure 7

On **side B**, where would you put 2 bottle-tops of the same weight as those on **side A** in order to balance the beam? Show your work.

 _____ (3 marks)

18. A pupil is given the materials shown in **figure 8** below.

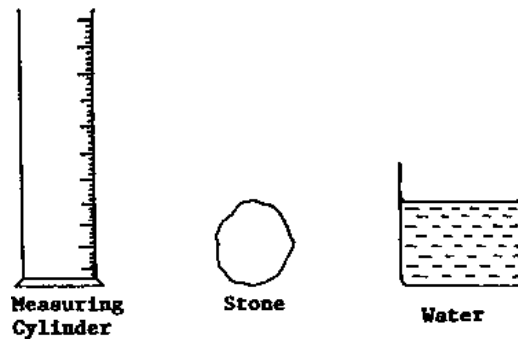


Figure 8

Explain how the pupil would use the measuring cylinder and the water to measure the volume of the stone.

_____ (3 marks)

19. **Figure 9** is a diagram showing beaks of two different birds.



Figure 9

a. Suggest the type of food each one of them feeds on.

(i) **A** feeds on _____ (1 mark)

(ii) **B** feeds on _____ (1 mark)

b. Give reasons for your answer to 19a (i) and (ii).

(i) **A** _____ (1 mark)

(ii) **B** _____ (1 mark)

20. **Figure 10** is a diagram showing a ray of light striking a glass containing water.

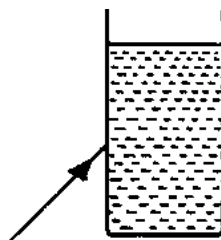


Figure 10

Complete the diagram to show how the ray passes through the water and comes out on the other side of the glass. (2 marks)

HEALTH EDUCATION

21. a. What do you call a place where two or more bones meet?

_____ (1 mark)

b. Mention **one** common injury that can occur where two or more bones meet.

_____ (1 mark)

c. State **one** sign of the injury you have mentioned in 21b.

_____ (1 mark)

22. a. Study the following list of food items:

cassava, fish, beans, pineapples, rice and mangoes.

Choose any **three** food items from the above list which make a balanced meal.

_____ (2 marks)

b. How does each of the **three** food items you have chosen in 22a help to make a balanced meal?

(i) _____

(ii) _____

(iii) _____ (3 marks)

23. a. A patient with diarrhoea should be given plenty of water to which some substances are added.

Mention the **two** substances.

(i) _____

(ii) _____ (2 marks)

b. Give **one** reason why a patient with diarrhoea should be given such a drink.

_____ (1 mark)

24. State why it is necessary to

a. prevent things from entering our eyes.

_____ (1 mark)

b. have our eyes checked by an eye specialist regularly.

_____ (1 mark)

25. **Figure 11** is a diagram showing a road sign.



Figure 11

a. What is the meaning of this road sign?

_____ (1 mark)

b. **Figure 12** is a diagram showing two roads crossing.

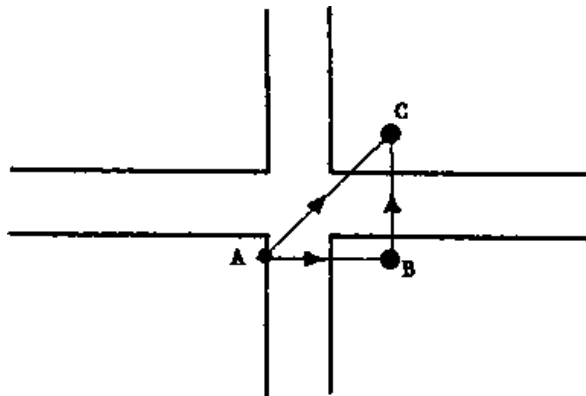


Figure 12

(i) You want to go to **C** from **A** on a busy day. Which path is safer, **A** to **C** direct, or **A** to **B** and then to **C**?

_____ (1 mark)

(ii) Give a reason for your choice.

_____ (1 mark)

26. a. State **two** reasons why it is more important to breathe through the nose than through the mouth.

_____ (2 marks)

b. (i) Write **one** possible cause of nose bleeding.

_____ (1 mark)

(ii) What first aid would you give to a patient with nose bleeding?

_____ (2 marks)

27. a. What is immunisation?

_____ (1 mark)

b. Mention **one** way in which immunisation is done.

_____ (1 mark)

c. State **one** disease that can be prevented by immunisation.

_____ (1 mark)

28. **Figure 13** is a flow diagram which can be used by a family to make river water safe for drinking.

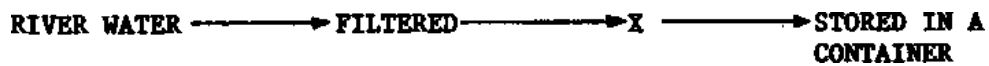


Figure 13

a. Why is the water filtered?

_____ (1 mark)

b. Why is the water still not safe for drinking after being filtered?

_____ (1 mark)

c. (i) What process is carried out at **X**?

_____ (1 mark)

(ii) Explain why the process carried out at **X** is important.

_____ (1 mark)

d. How is the water protected from contamination when stored in the container?

_____ (1 mark)

29. a. Give **two** differences in behaviour between a person who is drunk and one who is not drunk.

Drunk	Not Drunk
(i) _____	_____
(ii) _____	_____
_____	_____

(2 marks)

b. Give **two** reasons why it is important to avoid smoking indian hemp (chamba).

(i) _____

(ii) _____ (2 marks)

30. a. State **two** ways in which a person can get infected by rabies.

(i) _____

(ii) _____ (2 marks)

b. Give **two** ways in which dogs can be protected from diseases.

(i) _____

(ii) _____ (2 marks)

31. a. Name any **one** organisation which deals with Public Health in Malawi.

_____ (1 mark)

b. Mention **two** parts of the human body where bilharzia parasites feed and lay their eggs.

(i) _____

(ii) _____ (2 marks)

END OF QUESTION PAPER

3.4.5. 1994 Primary School Leaving Certificate Examinations/Agriculture Incorporated Paper

THE MALAWI NATIONAL EXAMINATIONS BOARD

1994 PRIMARY SCHOOL LEAVING CERTIFICATE EXAMINATION

AGRICULTURE

Subject Number: P012

Tuesday, 12 July

(100 marks)

**Time Allowed: 2 hours
1.30 - 3.30 pm**

Instructions:

1. **This paper contains 15 pages. Please check.**
2. Write your **District Name, Centre Number, and Examination Number** In the spaces at the **top of every page.**
3. Answer **all** questions in the spaces provided.
4. The marks for each question are indicated in the brackets.
5. If you find any question too difficult, leave it and return to it later.
6. If time allows, check your answers.
7. If you have any questions about these instructions, ask them now. You may not ask questions once the examination has begun.

Answer **all** questions

(Each question carries 4 marks)

1. The diagram below shows a fruit crop.



a. Name the fruit crop.

_____ (1 mark)

b. Name the planting material for the crop shown in the diagram.

_____ (1 mark)

c. Give any **two** varieties of the fruit crop.

(i) _____ (1 mark)

(ii) _____ (1 mark)

2. a. How do cattle get infected by liverfluke?

_____ (1 mark)

b. What effect does liverfluke have on cattle?

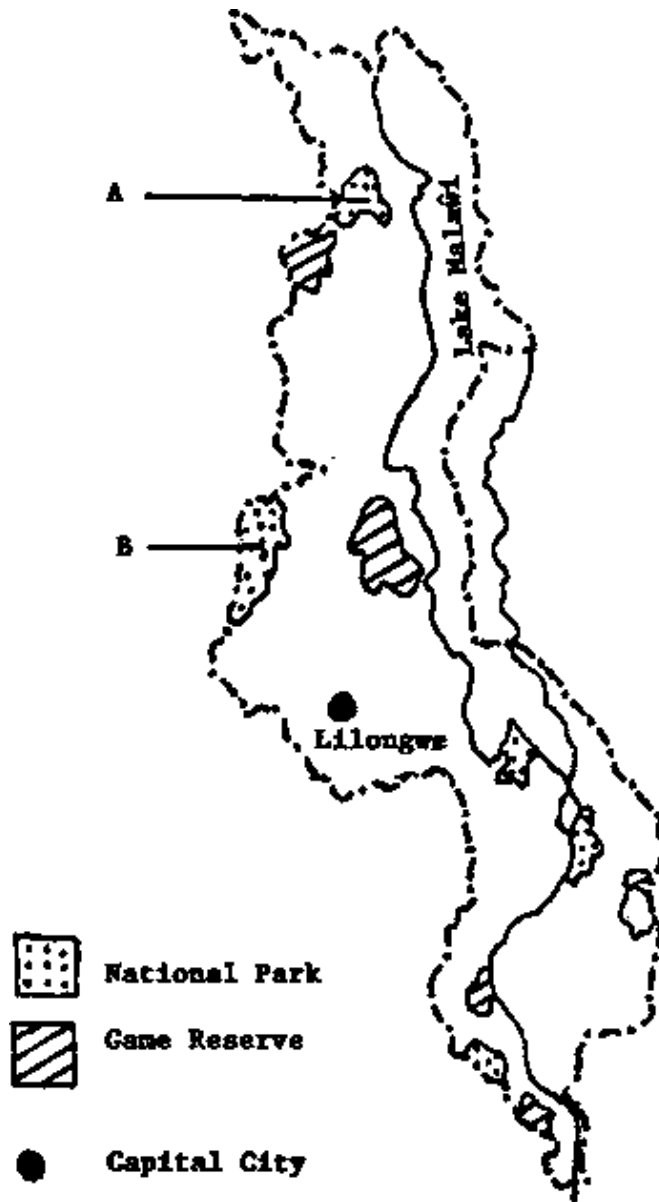
_____ (1 mark)

c. State any **two** methods of controlling liverfluke.

(i) _____
_____ (1 mark)

(ii) _____
_____ (1 mark)

The map below shows the national parks and game reserves of Malawi.



a. Name the National Parks labelled A and B.

A _____ (1 mark)

B _____ (1 mark)

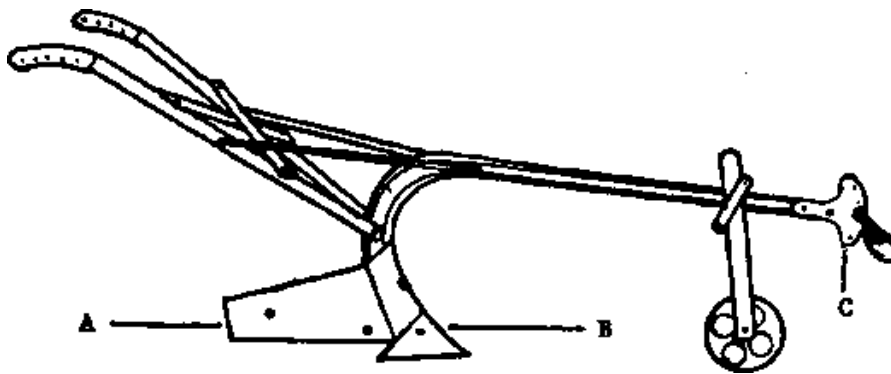
b. Name any **one** animal which is commonly found in B.

_____ (1 mark)

c. State any **one** method of conserving wild life in a National Park.

_____ (1 mark)

4. The diagram below shows a farm implement.



a. Name the farm implement.
_____ (1 mark)

b. Identify the parts labelled **A** and **B**.

A _____ (1 mark)

B _____ (1 mark)

c. What is the function of the part labelled **C**?
_____ (1 mark)

5. a. Name any **two** varieties of oranges grown in Malawi.

(i) _____ (1 mark)

(ii) _____ (1 mark)

b. Name the most serious disease of oranges.
_____ (1 mark)

c. How can the named disease be controlled?
_____ (1 mark)

7. The diagram below shows a method of harvesting maize.



a. Name the method.

_____ (1 mark)

b. State **two** advantages of this method of harvesting maize,

(i) _____ (1 mark)

(ii) _____ (1 mark)

c. State **one** disadvantage of this method of harvesting maize.

_____ (1 mark)

a. Name **one** tool that is recommended for transplanting vegetable seedlings.

_____ (1 mark)

b. What is the recommended spacing for large headed cabbage varieties?

_____ (1 mark)

c. State **two** ways of controlling aphids in cabbage.

(i) _____ (1 mark)

(ii) _____ (1 mark)

8. a. State any **two** reasons why farmers keep farm records.

(i) _____ (1 mark)

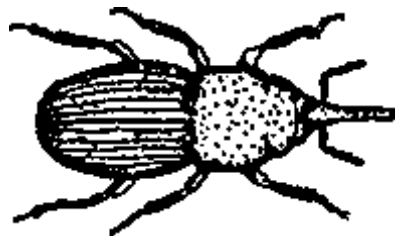
(ii) _____ (1 mark)

b. Explain the **two** main types of farm records.

(i) _____ (1 mark)

(ii) _____ (1 mark)

9. The diagram below shows a crop pest.



a. Identify the pest.

_____ (1 mark)

b. Name the crop attacked by the pest.

_____ (1 mark)

c. State the damage caused by the pest.

_____ (1 mark)

d. How can the pest be controlled?

_____ (1 mark)

10. a. What are natural resources?

_____ (1 mark)

b. How can the following natural resources be conserved?

(i) Soil _____ (1 mark)

(ii) Vegetable _____ (1 mark)

(iii) Water _____ (1 mark)

11. The diagram below shows a vegetable crop.



a. Name the crop.

_____ (1 mark)

b. To which group of vegetables does it belong?

_____ (1 mark)

c. Give a reason why the crop does not require Nitrogen fertilizer.

_____ (1 mark)

d. How would you control aphid attack in the named crop?

_____ (1 mark)

12. The table below shows characteristics of soil.

Soil Characteristics	Soil A	Soil B	Soil C
Texture	Very fine	Course	Fine to course
Aeration	Poor	Good	Moderately good
Water holding	Very high	Low	Medium
Nutrient holding capacity	Very high	Low	Medium

a. Identify soils **A** and **B**.

(i) **A** _____ (1 mark)

(ii) **B** _____ (1 mark)

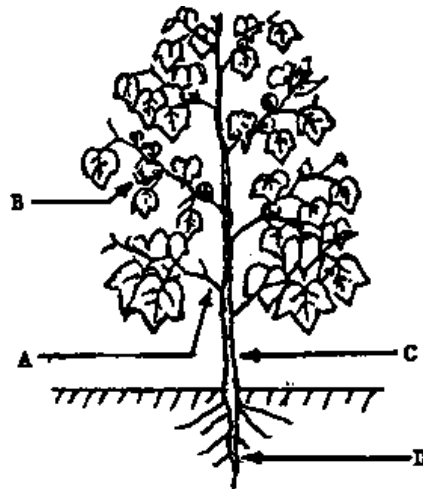
b. Which of the **three** soils **A**, **B** and **C** is most suitable for the growing of maize?

_____ (1 mark)

c. How would you improve the water holding capacity of soil **B**?

 _____ (1 mark)

13. The diagram below shows parts of a cotton plant.



a. Name the parts labelled **A** and **B**.

A _____ (1 mark)

B _____ (1 mark)

b. What is the function of the part labelled **C**?

_____ (1 mark)

c. Identify the type of root system labelled **D**.

_____ (1 mark)

14. The diagram below shows a type of cattle khola.



a. Name the type of khola.

_____ (1 mark)

b. Give any **two** disadvantages of such type of khola.

(i) _____ (1 mark)

(ii) _____ (1 mark)

c. State **one** way of improving this type of khola.

_____ (1 mark)

15. a. Define the term experiment.

_____ (1 mark)

b. Give **one** reason why field experiments are important in agriculture.

_____ (1 mark)

c. What is fertilizer trial?

_____ (2 mark)

6. Explain how the following environmental factors influence agriculture production:

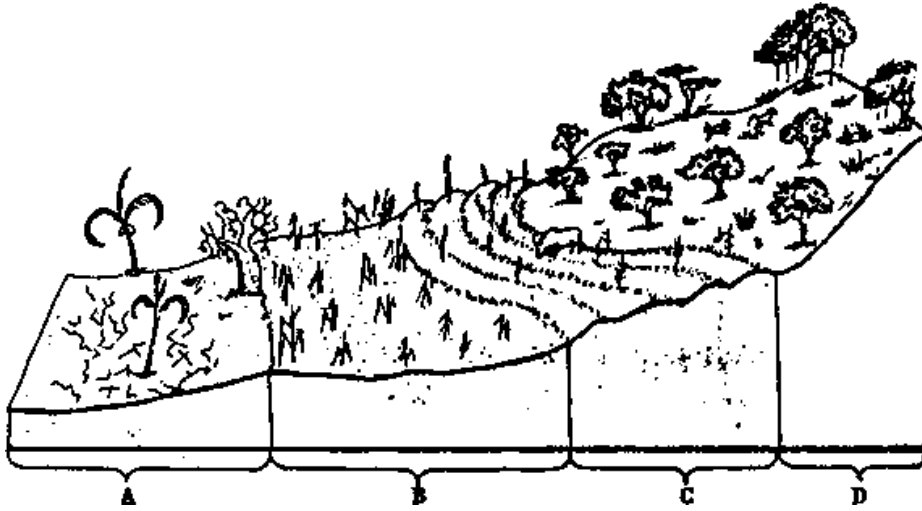
a. Rainfall

_____ (2 marks)

b. Temperature

_____ (2 marks)

17. The diagram below illustrates groups of class of land.



a. Name the groups of classes labelled **A** and **C**.

A _____ (1 mark)

C _____ (1 mark)

b. State the most suitable use for each of the groups of classes of land labelled **B** and **D**.

(i) **B** _____ (1 mark)

(ii) **D** _____ (1 mark)

18. Name **one** tool or implement used in each of the following centres of civilization:

a. China

_____ (1 mark)

b. Egypt

_____ (1 mark)

c. India

_____ (1 mark)

d. Mesopotamia

_____ (1 mark)

19. a. Mention **two** types of fish suitable for pond breeding.

(i) _____ (1 mark)

(ii) _____ (1 mark)

b. Give **one** reason why manure is applied to fish ponds.

_____ (1 mark)

c. Give **one** reason why farmers are encouraged to grow fish in ponds.

_____ (1 mark)

20. a. Name any **two** types of goats based on function.

(i) _____ (1 mark)

(ii) _____ (1 mark)

b. Explain any **one** principle of goat management.

_____ (2 marks)

21. The diagrams below show some common tools on farms in Malawi.



A



B

a. Name the tools labelled **A** and **B**.

A _____ (1 mark)

B _____ (1 mark)

b. Give **one** use of each tool.

A _____ (1 mark)

B _____ (1 mark)

22. State **two** advantages and **two** disadvantages of deep litter system of keeping poultry.

a. advantages:

(i) _____ (1 mark)

(ii) _____ (1 mark)

b. disadvantages:

(i) _____ (1 mark)

(ii) _____ (1 mark)

23. A farmer sows Malimba groundnuts at one seed per hole, 10 cm apart in a single row on ridges which are 90 cm apart.

a. Calculate the plant population per hectare. Show your working.

(2 marks)

b. State **two** ways in which high plant population reduces yield.

(i) _____

_____ (1 mark)

(ii) _____

_____ (1 mark)

24. State any **four** reasons for the rapid agricultural development in Malawi after independence.

a. _____

b. _____

c. _____

d. _____

_____ (4 marks)

25. A farmer has 1.5 hectares of land on which to plant hybrid maize. The recommended seed rate is 25 kg per hectare.

a. How much seed should he buy? Show your working.

(2 marks)

b. How much fertilizer should he buy if the recommended rate is 100 kg of urea per hectare? Show your working.

(2 marks)

END OF QUESTION PAPER

Note: This paper contains 15 papers

3.5. Namibia

3.5.1. Overview

End of School Examination

1. Title of examination:	Junior Secondary Certificate (JSC)
2. Amount of fees charged:	≈ US\$6
3. Examination after years in school (6, 7, 8 years):	10 yrs
4. Children's entry age in primary school:	6 yrs
5. Number of pupils sitting examination in 1994:	15,000 - 20,000
6. Examination subjects offered:	9
7. Language of examination:	English
8. Institution setting the examination questions:	Examinations Directorate
9. Have there been any reforms in the examination questions?	Yes
When? (year)	1992
What kind?	Increase the number of multiple-choice items. Change from only recall to other domains as well. Make more use of diagrams. Include more continued assessment and start making use of projects.
10. Stages of development of examination questions(please describe):	<ul style="list-style-type: none">• Make sure all people know the syllabus.• Invite people to the item-writing workshop (to be nominated by the regional offices).• Put up a specification grid.• Divide in groups. Groups work on various topics. Every member of the group writes items (15-20 each) according to the specification grid.• Workshop co-ordinated by curriculum expert or examination expert.• Groups exchange items, moderate, improve or reject.• Items stored in bank.• Examination expert/curriculum expert finalizing examination paper.
11. Type of examination questions and distribution of different kind of questions	30% multiple-choice 5% closed type 5% matching 60% structured

12. Is continuous assessment incorporated in the final examination?	Yes [x] No []
If yes, to what extent?	It varies from 33%-50%.
13. Are examination items pretested?	Yes [] No [x] 4 pilot schools will write a full Junior Secondary Certificate examination used for pre-testing purposes.
14. Which professional groups are involved in setting the examination questions?	<ul style="list-style-type: none"> • Secondary school teachers • School inspectors (subject advisors) • Examination and curriculum experts
15. Are the same professionals who set the examination questions involved in marking papers?	Yes [x] No [] They are involved in item-writing and marking, however, not responsible for final examination papers' design.
16. How are examination results used for improving teaching?	Every year an examiners' report and moderators' report is sent to schools after examinations, giving hints and recommendations on how to improve answering items and teaching.
17. To what other uses are the examination results put?	<ul style="list-style-type: none"> • Junior Secondary Certificate • Entering into IGCSE (International General Certificate of Secondary Education) (selection) • Monitoring education, teachers' performance, curriculum.
18. Main problem with School Leaving Examinations?	<ul style="list-style-type: none"> • Lack of experts in multiple-choice item-writing. • Lack of experts in continued assessment. • Lack of resources.

Note: The introduction of an end of primary school examination is planned for 1999. The following statements concern the existing Junior Secondary Certificate only.

3.5.2. Curriculum Development and Examinations in Namibia

by Jacobus A. Myburgh, Directorate of Curriculum Research and Development, and Cavin M. Nyambe, Directorate of Examinations

Curriculum Development since Independence

Namibia gained its independence in March 1990 after 105 years under foreign rule, thereby becoming the last country in Africa to be de-colonialized. Namibia is a vast, sparsely populated country on the South Atlantic coast. It is bordered by Botswana and Zimbabwe in the East, South Africa in the South and Angola and Zambia in the North. The capital is Windhoek. Namibia occupies an area of 82,4296 sqkm and is mainly arid or semi-arid, with the Namib Desert, the oldest in the world, extending along the entire coastline. In the North Eastern Caprivi Region the annual rainfall is, however, approximately 600 mm per annum. We have a population of 1.5 million with a population density of 1.5 persons per square kilometre. There are eleven ethnic groups. A variety of 18 different languages and dialects are spoken. The official language is English.

450,000 pupils enrolled in Namibia's schools for 1992. The distribution in the different school phases are as follows.

Grade	1 - 3 (junior primary)	204,350
	4 - 7 (senior primary)	156,825
	8 - 10 (junior secondary)	75,013
	11 - 12 (senior secondary)	13,269

Following independence it was decided by the Ministry of Education and Culture to embark upon a major reform process. Reform was initiated in junior secondary education. Local and international experts were given the task of redrafting the curricula for grades 8-10. The change-over to the new curriculum coincided with the change-over to English as the medium of instruction.

Learners in the Junior Secondary School (grades 8, 9 and 10) are now following the Namibian Junior Secondary Curriculum. The first national, external examination for grade 10 took place in 1993. There are, however, a number of project schools testing the new curriculum and allowing us to gain experience so as to enable us to make the necessary changes, if any, to the curriculum.

The Senior Secondary School introduced the internationally recognized IGCSE curriculum in 1994. The reform of primary school education has also been initiated and the new Broad Curriculum has been finalized. Curriculum panels have developed new syllabi for all the subjects.

Changes in Examinations

Examinations can be looked at in two ways as they can be internal which is school-based and external which is done at national level. The examinations are controlled by the Directorate of Examinations in Namibia.

(1) Primary School Leaving Examination (Grade 1-7)

Before independence, Namibia was divided into eleven ethnic groups, thus each group or region had full control over its internal examination. Question setting, marking and writing of progress reports was school-based. Promotion schedules which show all marks recorded for the year were approved by the regional inspectors. In some regions semi-external papers were set by different examiners in the region for grade 7.

Namibia does not offer any external examination after the primary phase. The mode of examination undertaken is school-based assessment, which is mainly under the control of the Regional Directors, Head-teachers and Subject Teachers. The examination is used for promotion and selection to the next grade or class. It is the responsibility of each school to draw up its own examination question papers and all other related materials. It is difficult to establish a national standard as the examination is not done at national level. The Ministry is preparing to introduce a school leaving certificate after Grade 7 in the near future. Experts from the Curriculum division and Examination division are engaged in the drafting of syllabi for Grade 5, 6 and 7.

(2) Junior Secondary School Leaving Examination

There is more emphasis put in this section. After the first two years (Grades 8 and 9) an internal examination is done by the school. At the end of the last part of the year (Grade 10) an external examination at national level is written by all schools registered. The Directorate of National Examinations and Assessment is responsible for control and administration. The New Broad Curriculum was implemented in 1991 on which a new national examination was written in November 1993. Examiners and markers are appointed at national level. Marking is centrally done, therefore it is easier to work out all the statistical information needed. It is a subject examination where a learner is graded on positive achievement. A certificate is awarded for every subject graded. The grade symbols are as follows: A, B, C, D, E, F, G, and UN (ungraded).

Learners are to do the following six compulsory subjects:

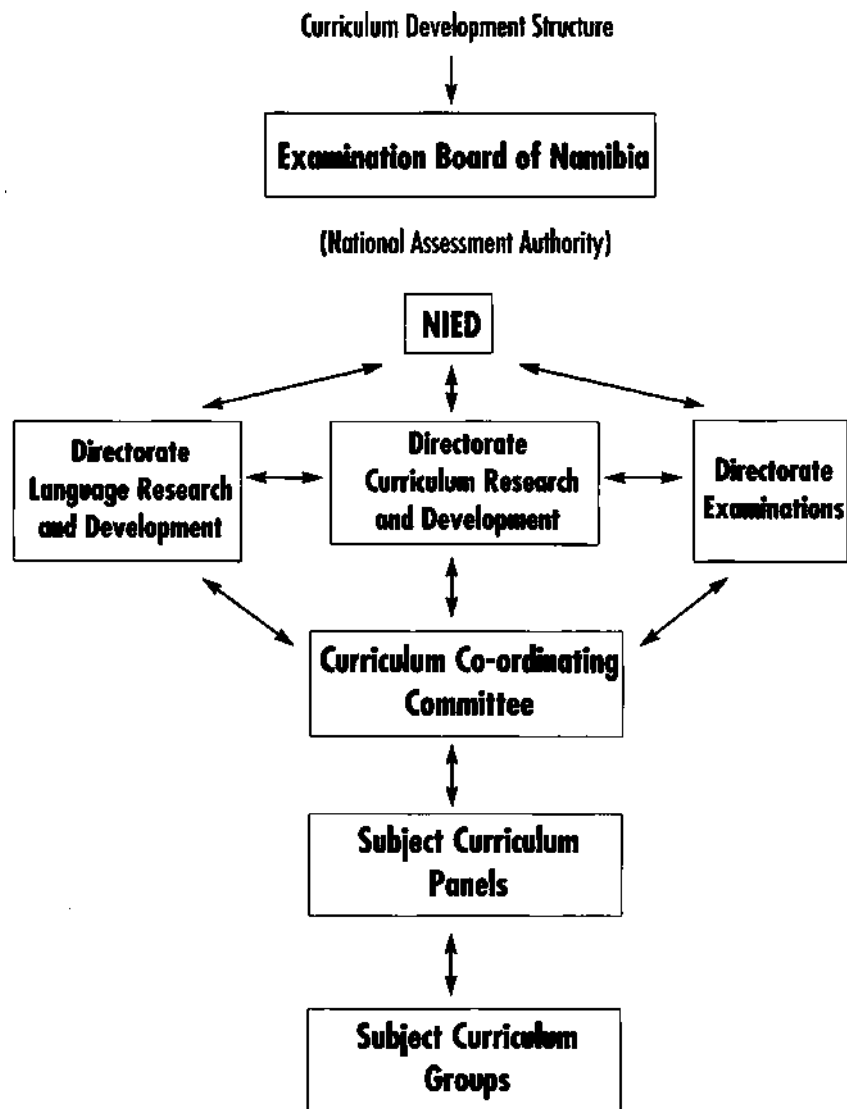
- English
- Mathematics
- Physical Science
- Life Science
- Geography
- History

There are options from the following subjects:

- Accounting
- Business Management
- Agricultural Production & Farming Technology
- Technical Subjects
- Music
- School Art, and many others.

A points system is used for the best six subjects as an entrance to IGCSE or HIGCSE.

Learners are expected to complete the Junior Secondary School between the age of 15-16 years.



NIED = National Institute for Educational Development

3.5.3. Agricultural Production and Farming Technology: Scheme of Assessment. Terminal Examination 1992

Paper 1

Section A: (45 minutes) 20 Multiple questions. (1 mark each); 5 close type (fill in the missing word, 1 mark each); matching type (5 marks)

Total: 30 marks

Section B: (1 hour 30 minutes) compulsory short-answer and structured question with subdivisions weighted as follows:

- | | |
|------------------------------------|----------|
| 1. General Agriculture (section 1) | 15 marks |
| 2. Crop Husbandry (section 2) | 25 marks |
| 3. Animal Husbandry (section 3) | 20 marks |
| 4. Farming Technology (section 4) | 10 marks |
| Total | 70 marks |

This will carry 50% while the continuous Assessment will also carry 50%. The final mark will be 100%.

Sample question from the Grade 10 Specimen paper for 1992 exams. (From the Draft)

Section A. Choose

1. What process involves loosening the soil before planting in order to obtain a deep, loose soil?

- a. harrowing
- b. levelling
- * c. ploughing
- d. ridging

2. What is the function of the epididymis?

- a. To make sperm
- b. To produce sperm
- * c. To store sperm
- d. To transport sperm

Fill in the missing words

3. (a) The water which is available to plants is known as.....?

(b).....is the production of crops and the rearing of livestock.

4. Choose from column B the correct word or phrase which suits the word in column A. Write the correct letter in the box provided.

Column A

Column B

1. mealie meal

A. Enzyme

2. Groundnut cake

B. Ovary

3. hand-hoe

C. Testes

4. Spermatogenesis

D. Carbohydrate-rich

5. Amylase

E. Farm tool

F. Protein rich Concentrate

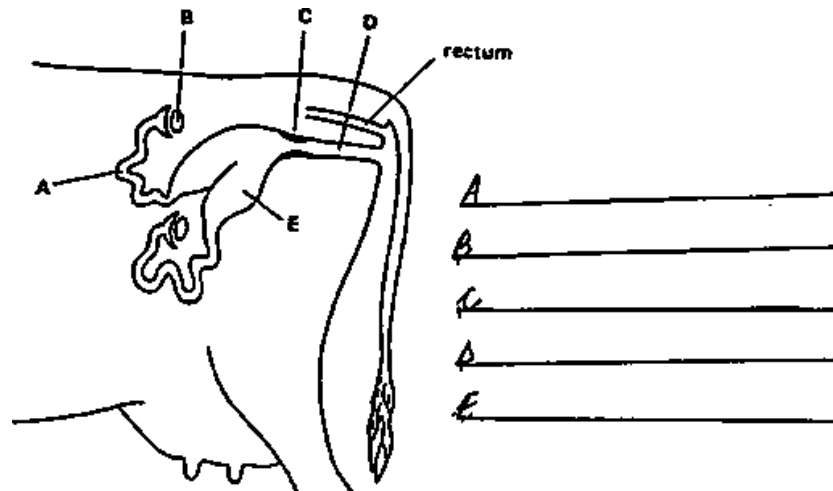
G. Roughage

Section B

1. State the function of the following parts of the ruminants digestive system.

- a. Teeth.....
- b. Rumen.....
- c. Small intestine.....

The diagram shows the reproductive system of a ruminant. Label the parts labelled A, B, C, D and F.



3.6. South Africa

3.6.1. *Independent Examinations Board.¹ Report on Standard 7 Pilot Programme. 1993 Examinations Programme*

by D.R. Pitt

¹ **Note:** In South Africa the Independent Examinations Board, a NON-Governmental Organization, offers an end of primary school examination. Preparations and trials were conducted in 1992/93. Since 1994 Std. VII leavers of primary school can sit this examination. The draft syllabus and examination papers (General Science) from 1993 and 1995 are included.

Examining Panels

In 1993 the IEB Standard 7 Pilot Examinations Programme was expanded to include I examinations in Combined Science, History and Geography, and examinations in English First and Second Language and Mathematics. In English and Mathematics continuity was maintained, members of the panel in most cases being previous examiners. The new examinations were set by examining panels, the members being nominated by the user groups and the final selection made by the IEB. Apart from three members of the Mathematics panel of four, all examiners were drawn from teachers in IEB schools.

Participants

Approximately 5,000 candidates from 77 schools were entered for the 1993 examinations. The subject breakdown was as follows:

English First Language:	3,500
English Second Language:	1,550
Mathematics:	4,500
Combined Science:	3,893
History:	3,219
Geography:	3,026

The participating schools were affiliated to different education authorities, and came from these areas:

Eastern and Western Cape
Transkei
Natal and Kwa-Zulu
Leboa, Gazankulu and Venda
Northern Transvaal
Bophuthatswana
The Vaal Triangle
Orange Free State

The school entries varied in number from 6 to 199, and were diverse in composition, some being single sex and others co-educational.

Comment

1993 marks the end of the Pilot Project begun in May 1990. Most of the objectives then set out have been achieved. They were:

- a. to gain expertise in the organization of a national examination and to build a cumulative record in English of the first IEB matriculation group of 1993;

- b. to involve schools in all parts of South Africa affiliated to varying education authorities;
- c. to involve teachers in every stage of the examining process;
- d. to explore the viability of testing a wide range of pupils in one examination.

One of the most significant developments of the project has been the establishment and expansion of the user groups, and the teachers involved have found the contacts across the academic and geographical spectrum immensely exciting and valuable.

3.6.2. Independent Examinations Board. Standard 7 Examinations 1993 - Combined Science

by Rose Smuts

The enormous differences in syllabus content which exist from school to school severely limited the points of reference of the 1993 Combined Science examination.

The skills which were considered by the initial examinations committee as relevant to 14 year olds are not adequately learnt in many schools, viz. construction of graphs, experimental method etc. Therefore a description of content and skills to be examined was circulated to all participating schools in July for their information.

Examination Format of the final 1993 Combined Science Examination

This was successful in the following respects:

- a. most candidates appeared to have sufficient time to complete the examination;
- b. most candidates were able to answer some questions on the paper;
- c. many teachers commented favourable on a **new approach** - »a breath of fresh air«; this was on the skills orientation of questions and the examination presentation;
- e. the marks achieved by all candidates were realistic, taking into account the limitations.

This examination was unsuccessful in the following respects:

- the »academically advantaged« candidates from well established schools who wrote the examination in their home language found the paper too easy - some silly errors were still made by these candidates, but some of their marks were unrealistically high;
- the factual content was limited and candidates were able to score well without having to put in a realistic effort.

Comments on the Examination

Section A

1. Many candidates do not know how to answer a series of multiple-choice questions.
2. The diagrams, graphs and some tables of data, needed clearer presentation.
3. Many people have unrealistic expectations of 14 year old Std 7 pupils; pages must not be too crowded as this leads to confusion; the language used must be simple and clear; giving of instructions and provision of data or text, must be at a level which is accessible to all.

4. Terms (such as hypothesis) need clarification; perhaps the syllabus should specify the use of some special terms (in this example »Aim« is preferable).

5. Certain skills considered by some teachers to be fundamental are lacking in many candidates. The IEB needs to set up communications and assistance in these areas:

- understanding text which includes some terminology
- graphs - their construction and interpretation
- science methodology - simple experimental procedure
- understanding and application of units of measurement
- models and their application for teaching the »abstract«
- biological sectional views

6. The »New Syllabus for 1994«, available early in 1994, will identify skills which can be used in order effectively to »teach« certain areas of the syllabus; the Exemplar Booklet, available in February 1994 will have further examples of lesson plans, ideas for teaching, notes on how to get into graphs - their construction, application and interpretation, some examination questions, flow charts etc.

Section B

1. The open ended, creative-type questions were poorly answered; they were either misinterpreted or the answers given were too non-specific. Their wording needs clarification.

2. The graphs were disastrous; they were either left out altogether, or incorrectly drawn - the application of bar graphs as opposed to line graphs, needs further elaboration. Identification of the dependent and independent variable was confused.

3. Experimental design was poorly executed; clear concise descriptions of method need encouragement; identification of variables also needs elaboration.

4. Calculations of a simple nature (% calculation) were poorly handled. There is no realization of cross-curriculum application of knowledge in some candidates.

5. The examination questions need to be relevant to everyday examples or situations.

6. Difficulties with language/text appear to be the root cause of many problems.

7. Pupils are unfamiliar with some »basic« materials e.g. cottonwool etc.

3.6.3. Draft Syllabus for General (Combined) Science¹ 1994

Independent Examinations Board

¹ Implementation date: 1994. This document is of an interim nature, subject to revision. It will form part of a larger syllabus covering the whole of the junior secondary phase.

1. Introduction

The Independent Examination Board syllabus for General (or Combined) Science for the General Education Certificate is, at this stage, an interim syllabus designed for the examination of students (age 14 - plus: Standard Seven level) from the end of 1994.

Both the syllabus itself and the use of the name »General Science« are based on the current core syllabus. However, the IEB believes that a very different approach to the teaching of the subject will be encouraged by the setting of examination questions which focus on the aims and objectives outlined below.

The content of this syllabus has thus been reorganised in what is believed to be a more integrated and more meaningful way. The order of presenting the syllabus content is in no way finite and can be re-arranged by any inventive teacher, in order to suit his/her particular vision. An integrated approach is however strongly recommended as integrated questions will be used in the IEB examination.

The main sections of this syllabus are as follows:

- Aims
- General Objectives
- Specific Curriculum Objectives
- Assessment Specifications

2. Aims/Educational Purpose of the Course

The aims are the same for ALL students independent of background and/or future career prospects in the sciences. They are not listed in any order of priority. The course is based on the assumption that the examination will take place at the end of the compulsory phase of schooling, and that successful candidates will have demonstrated a good basic education in science serving as a foundation both for further learning and for life in general.

The aims are to enable students to acquire:

2.1 Some basic SCIENTIFIC KNOWLEDGE which will enable them to understand their world better, communicate better and/or pursue studies in science or science dependent courses, beyond the Std. 7 level.

2.2 Certain manual and thinking skills which are useful in solving scientific and/or everyday problems.

2.3 An awareness of what science is all about and of its importance in everyday life.

2.4 Certain useful attitudes about themselves, their safety, the processes of science and their environment.

3. General Objectives

These relate to the four main aims listed above.

3.1 Knowledge

At the end of the course students should be able to demonstrate KNOWLEDGE AND UNDERSTANDING of:

- some basic scientific concepts and their application to familiar and new situations;
- some facts and concepts concerning the environment;
- the use of appropriate (although basic) instruments for scientific experiments;
- simple scientific vocabulary and its usage.

Note: The Curriculum Objectives define the factual material that students need to recall and explain. Questions testing these objectives will often begin with one of the following words: define, state, describe, explain or outline.

3.2 Manual and Thinking Skills

A. HANDLING INFORMATION AND SOLVING PROBLEMS

Students should be able, in words or using other written forms of presentation (ie. symbolic, graphical & numerical) to:

1. locate, select, organise and present information from a variety of sources;
2. transpose information from one form to another;
3. manipulate simple numerical and other data;
4. use information to identify patterns, report trends and draw simple conclusions;
5. present reasoned explanations of phenomena, patterns and relationships;
6. make simple predictions and propose hypotheses, giving supporting evidence;
7. solve problems, including some of a quantitative nature.

B. EXPERIMENTAL SKILLS AND INVESTIGATIONS

Students should be able to:

1. use techniques, apparatus and materials (including the following of a sequence of instructions where appropriate);
2. make and record observations and measurements;
3. interpret and evaluate experimental observations and data;
4. plan and carry out simple investigations, evaluate methods and suggest possible improvements (including the selection of techniques, apparatus and materials).

3.3 Attitudes

Students should have acquired attitudes of:

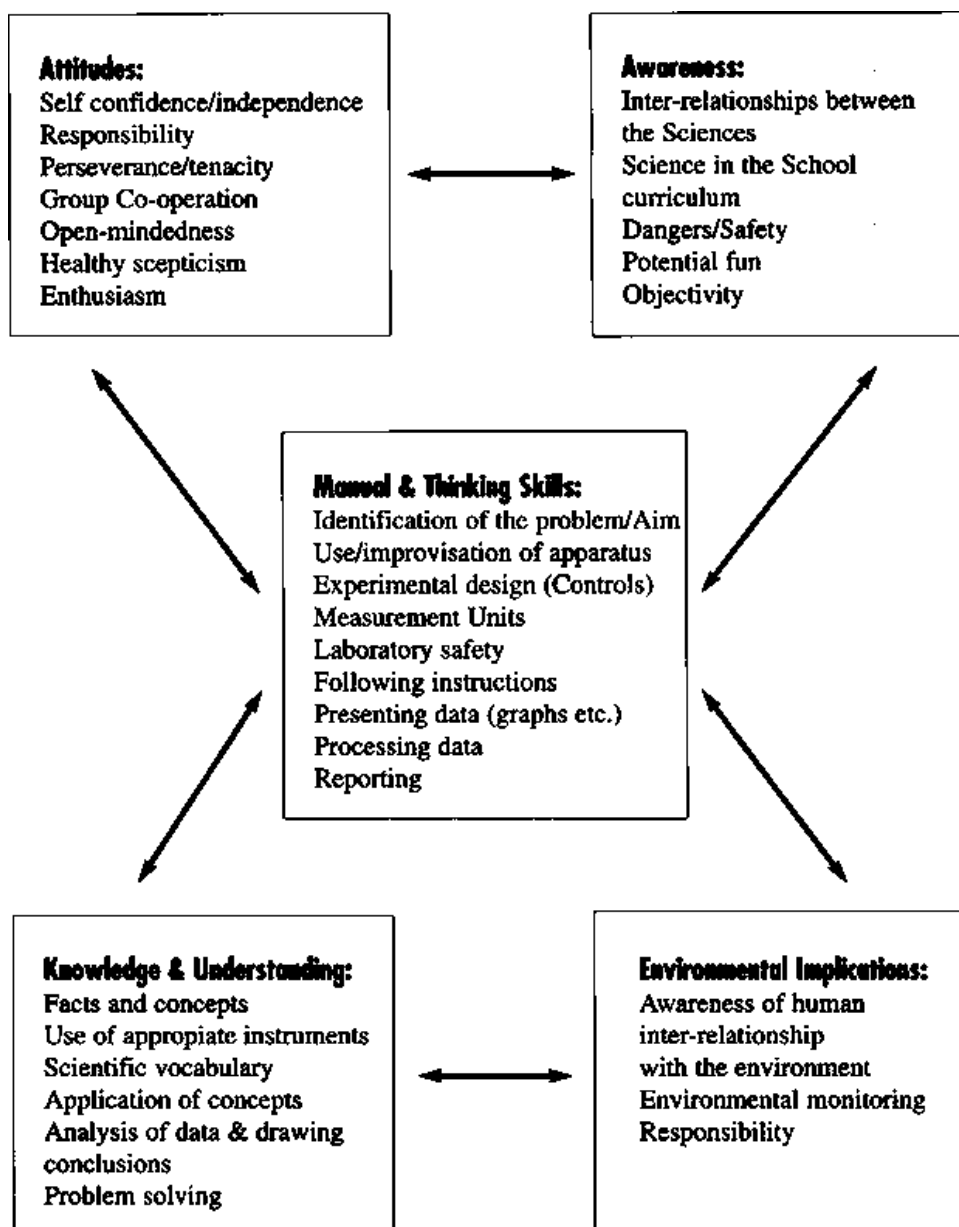
- self confidence and independence;
- responsibility for their own learning;
- perseverance and tenacity;
- tolerance for the views of others;
- co-operation when working in a group;
- open-mindedness towards alternative perspectives;
- a healthy scientific scepticism requiring justification;
- an enthusiasm for science.

3.4 Awareness

Students should demonstrate an awareness of:

- the inter-relationship of different disciplines of science;
- the relationship of science to other aspects of the school curriculum;
- the dangerous nature of certain substances and phenomena;
- the fun and enjoyment to be found in the science curriculum;
- the importance of objectivity in observation.

Note: Although the objectives 3.3 and 3.4 are difficult to measure in an external examination, they are considered as very important. Teachers should devise their own methods of assessing these summatively.



Summary of Inter-Relationships

4. Curriculum Objectives

It is important that the Physical Science and Biology content of this Standard 7 Syllabus should be presented in an integrated manner. To help accomplish this and to make it more meaningful, the syllabus has been re-ordered. Guidance has also been offered as to which thinking, process and manual skills can be used to enhance learning in each area of the syllabus.

The subject content is set out as a combination of the traditional Physics, Chemistry and Biology topics in an attempt to encourage teachers to use a more integrated approach in their teaching of these sciences. This does not mean that parallel teaching by a team of specialist teachers should not occur. Consultation, co-operation and cross-referencing are however recommended.

An explanatory booklet containing exemplars of course content will be made available to all participating schools early in 1994. This document should be read together with the syllabus.

Guidelines to the Examiner & all Teachers

1. The Curriculum Objectives outlined below are designed to provide guidance to as to what will be assessed; they are not meant to limit, in any way, the teaching programme of any particular school.

2. Only the subject material contained within the first two Columns entitled »Topic Core and Core Extensions« are examinable as regards factual content, in detail.

3. The »Supplement« section is optional; each teacher may decide whether or not to use material contained within this section. It is included in an attempt to provide guidance to the less experienced teacher. This section is printed in italics.

4. The »Skills & Teaching Suggestions« section in the exemplar booklet is likewise an aid to teachers. This section will, however, play a role in shaping the types of questions the IEB Combined Science Examination will contain. (Refer to the 1993 IEB Combined Science Examination in the IEB Combined Science Exemplar Booklet: available March 1994).

5. This Syllabus will form the basis of the IEB General [Combined] Science Examination. A list of topics to be examined externally by the IEB will be circularised each year.

6. The above-mentioned IEB Combined Science Exemplar Booklet contains:

- The 1993 IEB Combined Science Examination paper & marking memorandum;
- Hints on teaching aspects of the syllabus;
- A list of the thinking, process and manual skills students should be introduced to and ways of devising exercises which incorporate or illustrate these skills;
- Some sample lessons;
- Some sample tests or practical lesson suggestions, sample answers from students and their evaluation.
- This Exemplar Booklet will be upgraded and developed constantly; any teacher who has suitable material which could be included in this booklet, should be encouraged to submit it to:

The Deputy Director - Curriculum Development
Independent Examinations Board
PO Box 875
HIGHLANDS NORTH 2037

**3.6.4. Independent Examinations Board. General Science Examination Paper 1995
(General Education Certificate)**

EXAMINATION NUMBER _____

INDEPENDENT EXAMINATIONS BOARD

GENERAL EDUCATION CERTIFICATE
OCTOBER 1995

GENERAL SCIENCE EXAMINATION

Time: 1 ½ hours

100 marks

PLEASE READ THESE INSTRUCTIONS CAREFULLY

1. Write your examination number in the space provided at the top of this page.
2. This paper consists of 22 pages. Please check that your paper is complete.
3. Use the reading time to go through the examination paper carefully.
4. Write clearly and neatly.
5. Answer Questions 1-9 on the answer grid for multiple choice questions on Page 3.
6. Answer Questions 10-20 in the space provided on the question paper.

1-9	
10	
12	
13	
14	
15	
16	
17	
18	
19	
20	

TOTAL

READ THE INSTRUCTIONS BELOW **BEFORE** YOU ANSWER QUESTIONS 1-9.

Questions 1-9 are MULTIPLE CHOICE questions.

INSTRUCTIONS

1. Read each question through carefully.

For each question, there are FOUR possible answers (A, B, C and D). Three of these answers are WRONG. Only **one** of these answers is CORRECT.

2. Choose which ONE of the four possible answers is correct.
3. Look at the letter (A, B, C or D) next to the CORRECT answer.
4. On the page called ANSWER GRID FOR MULTIPLE CHOICE QUESTIONS (Page 3), find the number of the question. Use a PENCIL to draw a LARGE cross through the LETTER of the answer which you think is correct.
5. You may draw only ONE cross on each line.

Example:

QUESTION 64

Pure water

- A is a green solid
- B is a liquid
- C has a very strong smell
- D conducts electricity very well.

The answer to Question 64 is B. Show this on the Answer Sheet as below:

64	A	<input checked="" type="checkbox"/>	C	D
----	---	-------------------------------------	---	---

ANSWER GRID FOR MULTIPLE CHOICE QUESTIONS

1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D

QUESTION 1

'AIDS is caused by a virus which can only live in blood, semen, and vaginal fluid.' People can catch AIDS by...

- A using the same fork and knife as a person who has AIDS.
- B having sex with a person who has AIDS.
- C holding hands with a person who has AIDS.
- D swimming with a person who has AIDS.

QUESTION 2





Iron sulphide is

- A a MIXTURE which has properties of iron and properties of sulphur
- B a MIXTURE of iron and sulphur with properties which are NOT the same as the properties of iron and sulphur
- C a COMPOUND with the same properties as iron and sulphur
- D a COMPOUND with properties very different to the properties of iron and sulphur

(2)

QUESTION 3

Which activity below uses the most glucose?

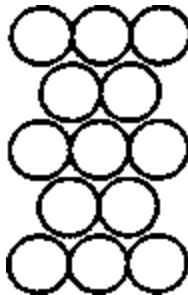
A		<p>Sleeping 4 kilojoules per minute</p>
B		<p>Sitting 6 kilojoules per minute</p>
C		<p>Standing 10 kilojoules per minute</p>
D		<p>Walking 17 kilojoules per minute</p>

The amount of energy a 65 kg man needs in a minute

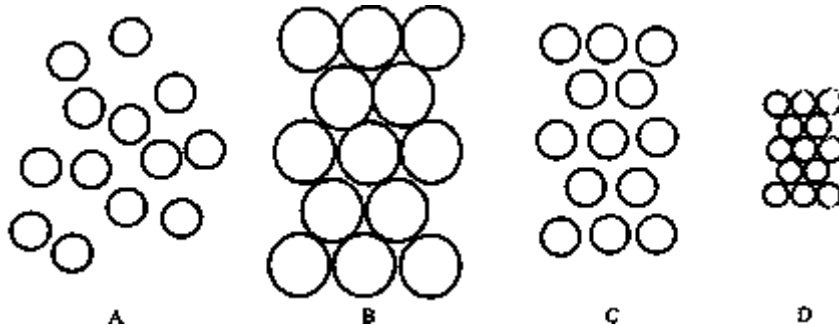
(2)

QUESTION 4

The diagram below represents the particles of which a metal teaspoon is made. The diagram shows how the particles are arranged on a very cold day.



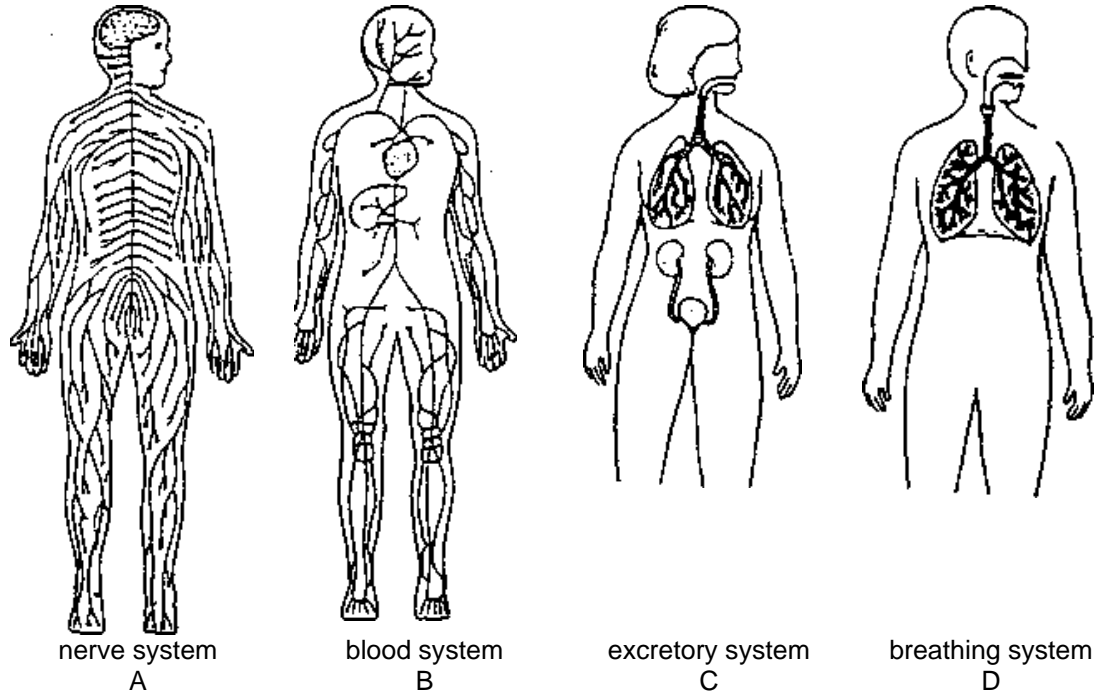
Which of the diagrams below represents the same particles after the teaspoon has been in boiling water for twenty minutes?



(2)

QUESTION 5

The following diagrams show different systems in the human body. Each system performs a life process. Choose the system that is involved in the transport of oxygen and nutrients throughout the body.



(2)

QUESTION 6

We inhale and exhale air all the time.

Choose the correct answer from the choices below.

- A Exhaled air contains less oxygen and less carbon-dioxide than inhaled air.
- B Exhaled air contains less oxygen and more carbon-dioxide than inhaled air.
- C Inhaled air contains less oxygen and more carbon-dioxide than exhaled air.
- D Exhaled air contains more oxygen and more carbon-dioxide than inhaled air.

(2)

QUESTIONS 7 AND 8 BOTH REFER TO THE DRAWING PIN IN DIAGRAM 7.

QUESTION 7

The area of the head of a drawing pin is 100 times bigger than the area of the point of the drawing pin.

A boy presses the drawing pin onto a piece of wood with a force of 15 N as shown below:

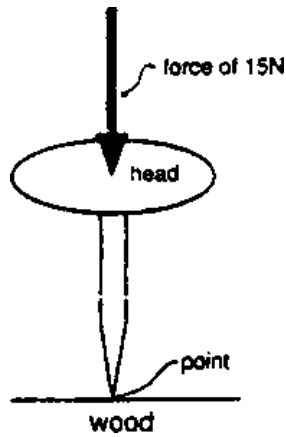


DIAGRAM 7

What force does the point of the drawing pin exert on the wood?

- A 15 N
- B $100 \times 15 \text{ N}$
- C $\frac{15 \text{ N}}{100}$
- D The point exerts no force on the wood.

(2)

QUESTION 8

The statements below are about the **pressure** acting on the head of the drawing pin and the **pressure** acting at the point of the pin.

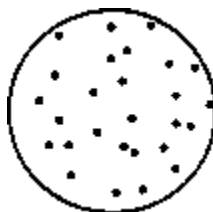
Which statement is correct?

- A The pressure acting on the head of the pin is the same as the pressure acting at the point of the pin.
- B The pressure acting at the point of the pin is greater than the pressure acting on the head of the pin.
- C The pressure acting at the point of the pin is smaller than the pressure acting on the head of the pin.
- D It is impossible to compare these pressures because the question does not give the area of the head or the area of the point of the pin.

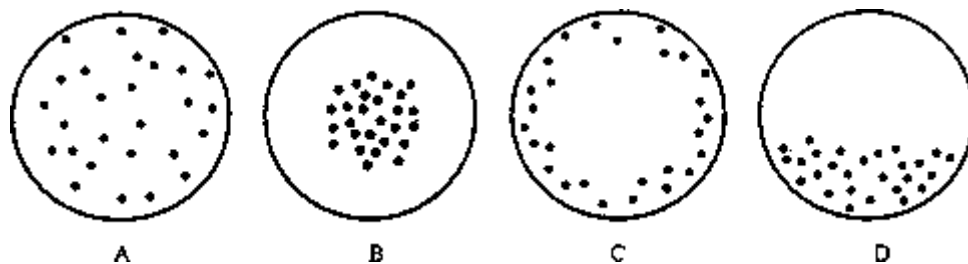
(2)

QUESTION 9

The picture below represents a **closed** container in which there are particles of the gas oxygen at room temperature.



Which of the diagrams below shows the arrangement of the same oxygen particles when we make the gas very cold? (The oxygen does NOT turn into a liquid when we cool it.)



(2)

18 marks

PLEASE ANSWER QUESTIONS 10-20 IN THE SPACES PROVIDED ON THE QUESTION PAPER.

QUESTION 10

Nitrogen reacts with hydrogen to form ammonia. Nitrogen, hydrogen and ammonia are gases at room temperature.

Diagram 10 below represents the particles of these three gases - nitrogen, hydrogen and ammonia.

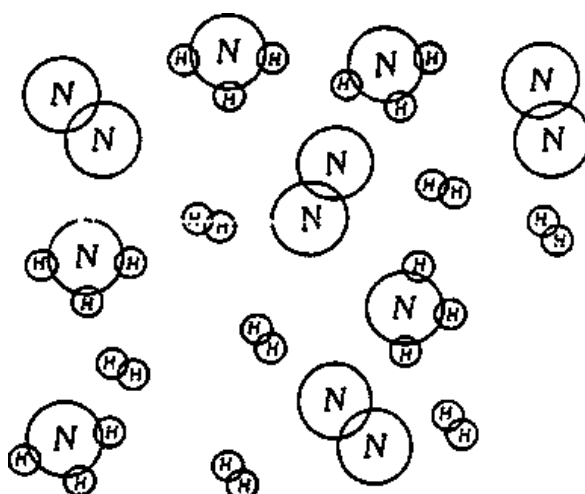


DIAGRAM 10

Use Diagram 10 to help you answer the questions below:

- 10.1 Is nitrogen an element or a compound? _____ (1)
- 10.2 Is ammonia an element or a compound? _____ (1)
- 10.3 Are the particles of nitrogen gas in Diagram 10 atoms or molecules? _____ (1)
- 10.4 Write the chemical formula for ammonia gas. _____ (2)
- 10.5 How many atoms of hydrogen are there in 6 molecules of ammonia? _____ (2)
- 10.6 Write the formula for 4 molecules of hydrogen gas. _____ (2)

9 marks

QUESTION 11

Look at Diagram 11 below.

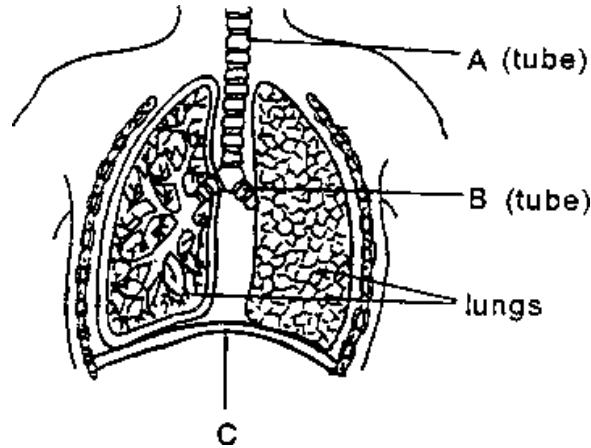


DIAGRAM 11

- 11.1 Give a label for each of the following structures:
 A _____ (2)
 B _____ (2)
- 11.2 Which letter points to a muscle? _____ (1)
- 11.3 Cross out the **WRONG** word or words in the following statements.
 11.3.1 When C moves downwards, the volume of the chest cavity (1)
 increases/decreases/stays the same.
 11.3.2 When C moves downwards, the air pressure inside the lungs (1)
 increases/decreases/stays the same.

5 marks

QUESTION 12

Diagram 12 below shows a long piece of wood (AB) with its one end (B) on the back of a truck.

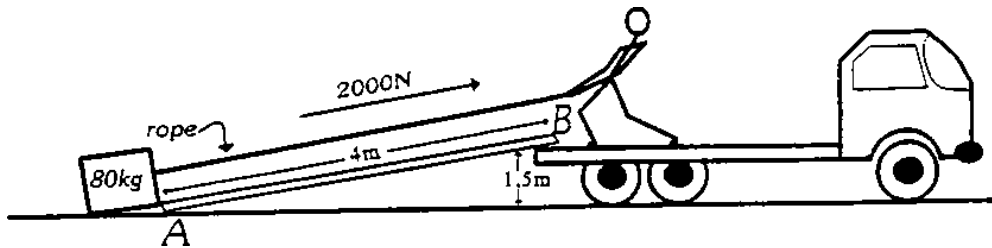


DIAGRAM 12

Allan uses a rope to pull a concrete block (of mass 80 kg) up the piece of wood onto the back of the truck. Allan pulls on the rope with a constant force of 2 000 N. The plank is 4m long. The back of the truck is 1,5m high.

12.1 How much **work** does Allan do to pull the block along the plank onto the truck? Use the formula

work = force x distance. (6)

12.2 Work out the weight of the concrete block.

(2)

8 marks

QUESTION 13

Diagram 13 below represents the human female reproductive system

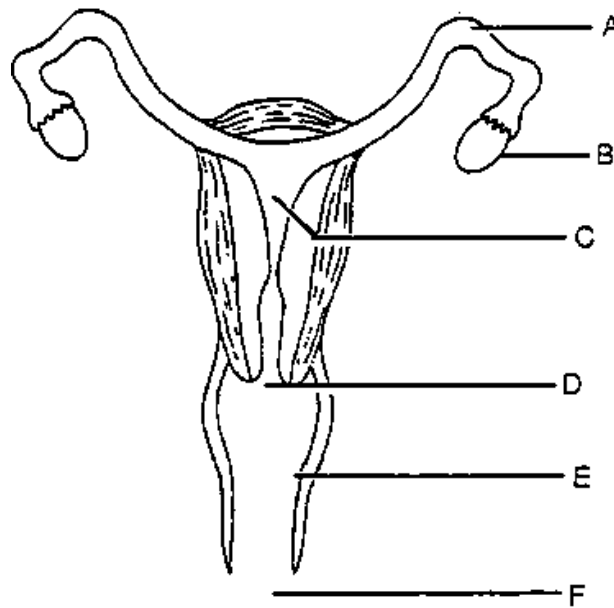


DIAGRAM 13

13.1 Match each statement in Column B to the correct word in Column A. Write the **number** of the correct statement in the space provided in Column A.

COLUMN A	COLUMN B
_____ CERVIX	1 The birth canal.
_____ VAGINA	2 The muscle which controls the opening of the womb.
_____ OVIDUCT	3 The organ in which eggs are made.
_____ OVARY	4 The place where fertilisation occurs.

(4)

13.2 Where should the contraceptive devices listed below be placed to prevent pregnancy? Use letters from Diagram 13 to answer.

IUD _____
 DIAPHRAGM _____

(2)

6 marks

QUESTION 14

An engineer puts a long steel beam (XY) on top of two concrete pillars as in Diagram 14.1 below.

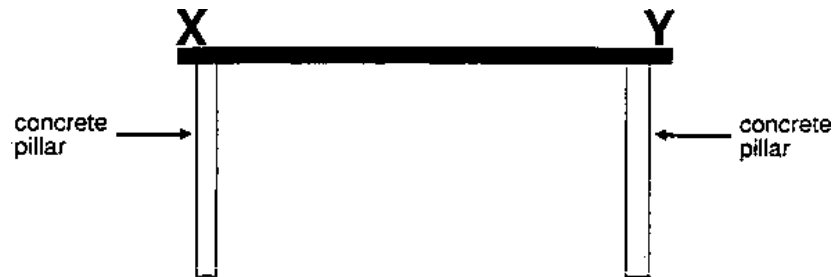


DIAGRAM 14.1

The engineer wants to find out how much the beam (XY) will bend (sag) when he hangs loads of different weight on the beam.

He hangs a load of known weight on the beam. He measures the sag (h) of the beam as shown in DIAGRAM 14.2 below.

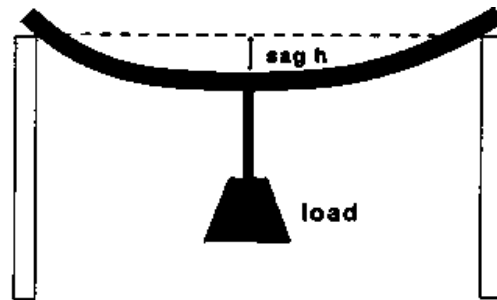


DIAGRAM 14.2

He measures the sag (h) for six different loads. He uses his results to plot a graph of Sag (in cm) on the y-axis against the Load (in N) on the x-axis. His graph is shown in Diagram 14.3.

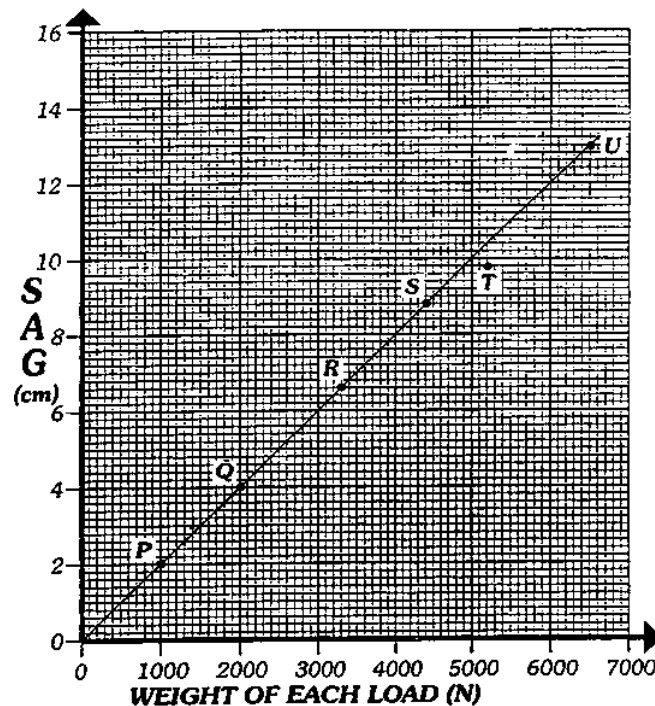


DIAGRAM 14.3

USE INFORMATION FROM THE GRAPH DIAGRAM 14.3 TO ANSWER THE QUESTIONS BELOW:

14.1 What is the weight (in N) of the load which will make the beam (XY) sag

(a) 4 cm? _____ (1)

(b) 7 cm? _____ (2)

14.2 How much (in cm) will the beam XY sag when a load of 4400 N hangs from its centre?

_____ (2)

14.3 The engineer made a mistake when he measured how much beam (XY) sags with a load of 5200 N.

How much **should** beam XY sag when a load of 5200 N hangs from its centre?

_____ (2)

14.4 The engineer tests another steel beam PQ. He puts the ends of PQ on top of two concrete pillars. PQ IS MUCH LONGER THAN XY, but it is the SAME thickness as XY. Will PQ sag more or less than XY under the same load?

_____ (1)

8 marks

QUESTION 15

Use Diagram 15 to answer the questions below.

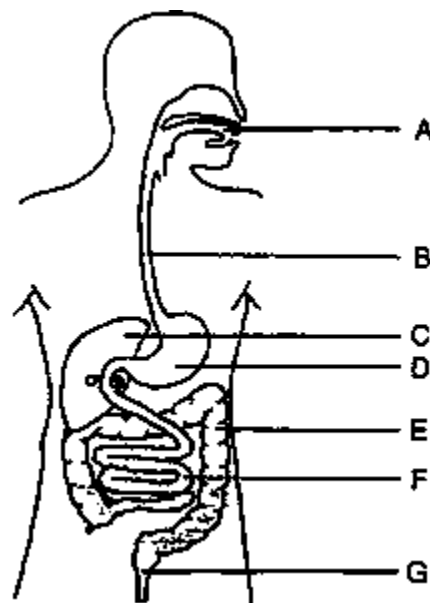


DIAGRAM 15

15.1 State **two places where** mechanical digestion takes place. (Use letters only)

 _____ (2)

15.2

15.2.1 Is digestive juice in D acid or alkaline?

_____ (1)

15.2.2 What indicator could you use to check your answer to 15.2.1?

_____ (1)

4 marks

QUESTION 16

In the space below draw and label a diagram of a cell from the human body eg. a cheek cell.

5 marks

QUESTION 17

When we push an object, we MAY do work on the object.

Table 17, on page 18 shows some things which may happen. In the table these things are called ACTIONS.

Read through Table 17 very carefully. For each ACTION (A, B, C and D), decide if work is done or if work is NOT being done. Fill in either YES or NO in the second column in TABLE 17.

17.1

	ACTION	IS WORK BEING DONE? Fill in YES or NO.
A	Fred pushes the wall as hard as he can. The wall does NOT move.	Does Fred do work on the wall? _____
B	Mary carries 6 very heavy books from the ground floor of a building up to the tenth floor of the building.	Does Mary do work on the books? _____
C	Four very strong poles hold up the roof of a house. The roof does NOT fall down.	Do the poles do work on the roof? _____
D	A ball falls towards the ground from a height of 1m.	Is work being done on the ball as it falls? _____

TABLE 17

(4)

17.2 Explain your answer to C in TABLE 17. Use words, 'distance', 'force' and 'work' in your explanation.

(3)

17.3 What kind of energy does the ball in D in Table 17 gain as it falls?

(1)

17.4 What kind of energy does the ball in D in Table 17 lose as it falls?

(1)

9 marks

QUESTION 18

Diagram 18.1 below shows some of the parts inside Mary's torch.

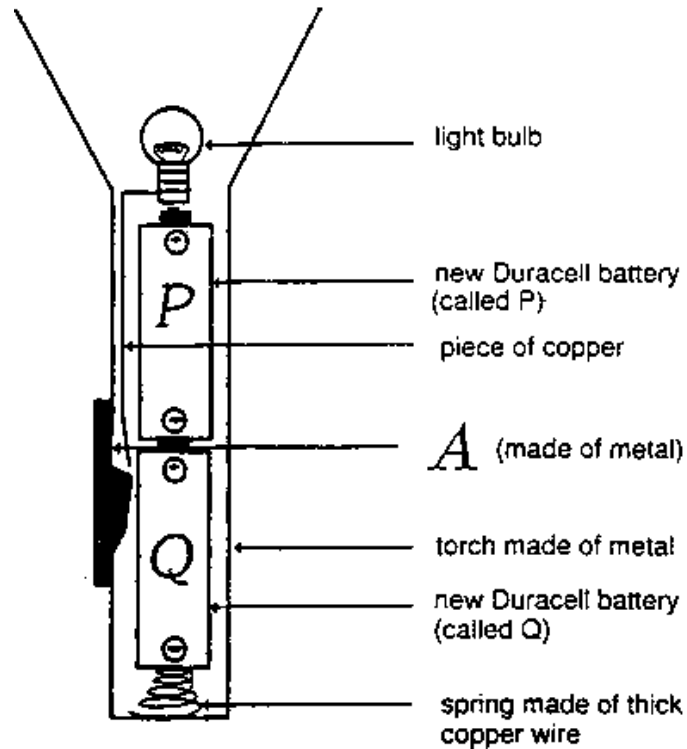


DIAGRAM 18.1

18.1 What will **happen** to the bulb in Mary's torch when she pushes A (in Diagram 18.1) **up**?

(1)

18.2 Draw an electrical circuit diagram to show EXACTLY how the parts in MARY'S TORCH in Diagram 18.1 are joined to each other. You MUST use the correct electrical symbols and you must put the following labels on your circuit diagram: Battery P, battery Q and part A. Label the + and - terminals on the Duracell batteries. The bulb in your circuit diagram must be turned off.

(6)

18.3 Marietjie has a new torch bulb and a new Duracell battery. She presses the bottom of the bulb hard against the bottom of the Duracell battery and holds it as shown in Diagram 18.3 below.



DIAGRAM 18.3

Marietjie's bulb does NOT light.

Draw a piece of copper wire in Diagram 18.3 which will make the bulb light. (2)

18.4 Tom has two light bulbs Bulb X and Bulb Y. Bulb X, has a thin filament. Bulb Y has a thick filament. The thick filament and the thin filament are the same length. See Diagram 18.4.

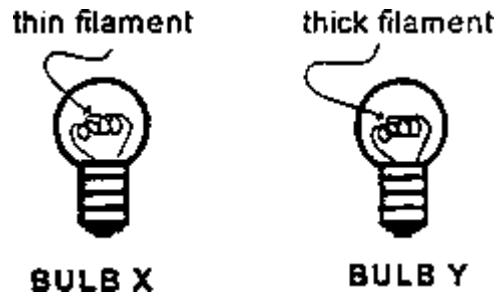


DIAGRAM 18.4

(a) Which bulb will carry more current if we put it into Mary's torch in Diagram 18.1?

Answer by writing Bulb X or Bulb Y.

_____ (1).

(b) Explain your answer to 18.4 (a).

 _____ (2)

12 marks

QUESTION 19

Diagram 19 below shows the relative amounts of different nutrients in some common foods. The numbers alongside each bar are the percentages of each nutrient.

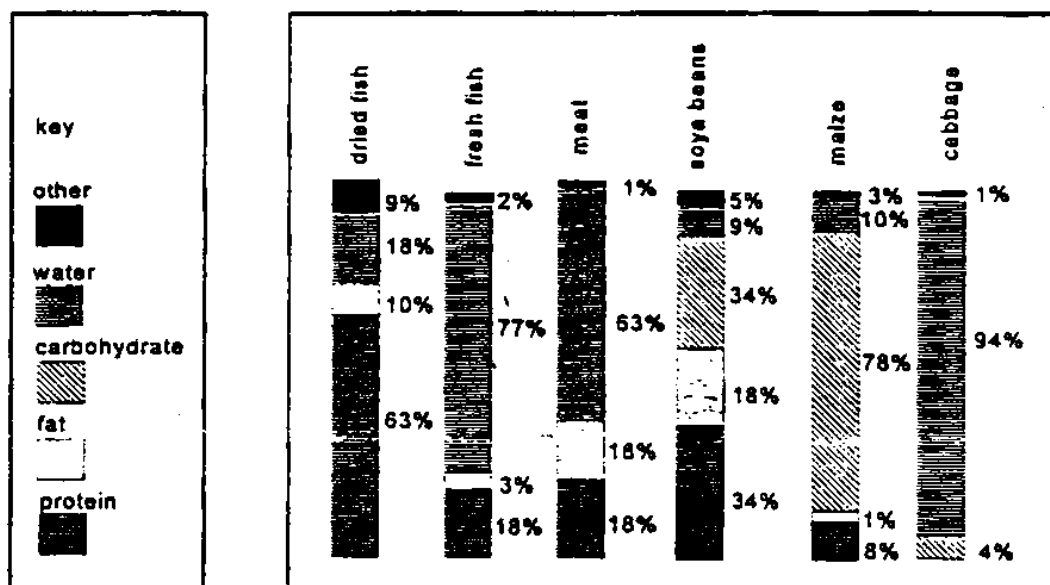


Diagram 19

19.1 Which food contains the highest percentage of carbohydrate?

_____ (1)

19.2 Why does the body need carbohydrates?

_____ (1)

19.3 Which food contains the lowest percentage of water?

_____ (1)

19.4 Which food would you recommend for a child suffering from Kwashiorkor?

_____ (1)

19.5

19.5.1 Which one of the above foods has the best balance of nutrients?

_____ (1)

19.5.2 Explain how you made your choice in 19.5.1.

_____ (2)

7 marks

QUESTION 20

Below is a diagram to show a leaf that has been cut in cross-section and is being looked at under a microscope.

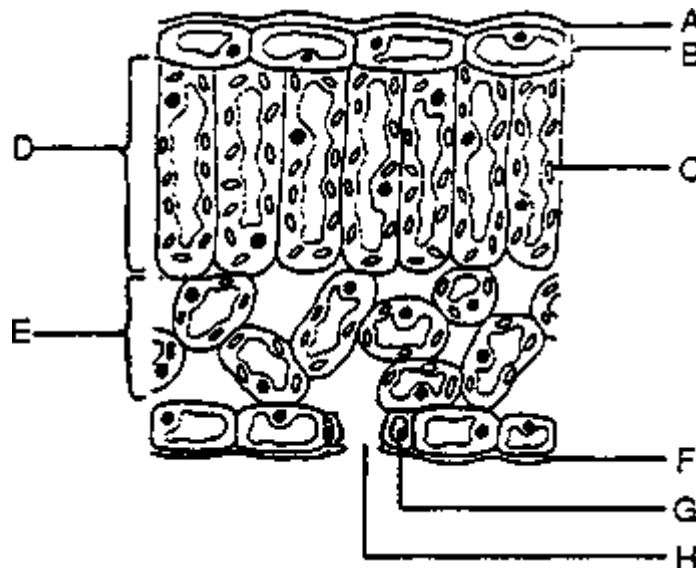


DIAGRAM 20

20.1 The leaf is an organ of a plant. It is made up of many different tissues. Choose TWO letters from the diagram that show two different kinds of tissues.

_____ (2)

20.2

20.2.1 Write down the letter of the tissue whose main function is photosynthesis.

_____ (1)

20.2.2 Use information from Diagram 20 to explain how you made your choice in 20.2.1.

_____ (3)

20.3 State the function of H. _____ (2)

20.4 What is the substance made in C, which turns iodine solution blue-black. (1)

9 marks

**3.6.5. Independent Examinations Board. Combined Science Examination Paper 1993
(Standard 7 Examination)**

INDEPENDENT EXAMINATIONS BOARD

**STANDARD 7 EXAMINATION
SEPTEMBER 1993**

COMBINED SCIENCE EXAMINATION

Time: 1¼ Hours

75 marks

PLEASE READ THESE INSTRUCTIONS CAREFULLY

1. Number your answers exactly as the questions are numbered.
2. It is in your interests to write legibly and to present your work neatly.
3. This examination consists of 2 sections:

Section A: 'Lucky Dip' (40 marks)

Section B: 'The Air Around Us' (35 marks)

4. Answer **ALL** questions in both sections in the **BLUE BOOKLET**.

5. This paper has been planned so that about one minute should be spent on each mark earned e.g. about 5 minutes should be spent on a question worth 5 marks.

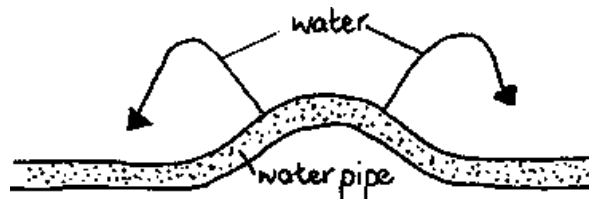
6. This paper consists of 24 pages: a white booklet (pages 1-11); and a blue booklet (pages 12-24). Please check that both booklets are complete.

SECTION A: "LUCKY-DIP" (40 marks)

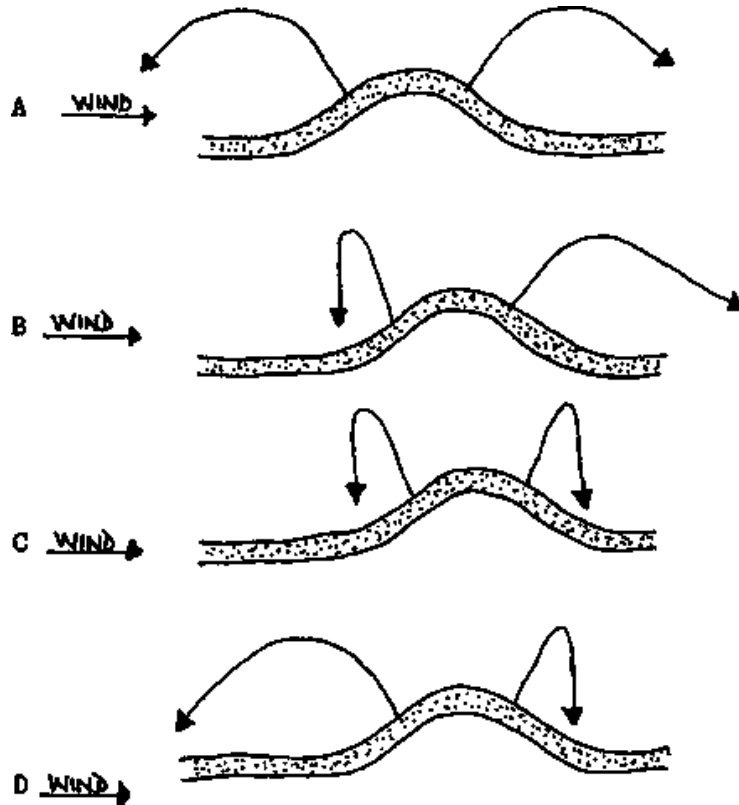
Answer all questions in this section on the special answer sheet in the blue booklet.

Questions 1 to 11 are all Multiple Choice Questions; just mark the appropriate letter (A, B, C or D) on the Answer Sheet, with a clear cross.

1. The diagram below represents water coming from 2 holes in a water pipe on a day with **NO** wind blowing.

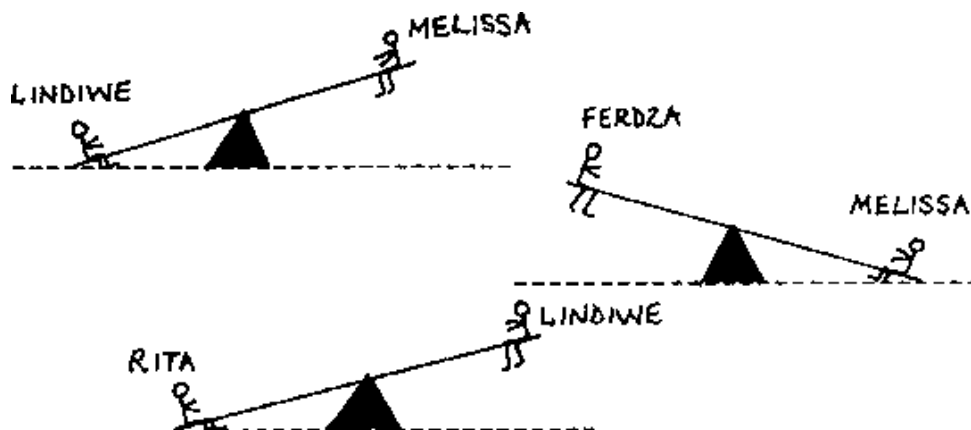


Now the wind blows in the direction that the arrows show. Choose the diagram which best shows how the water will move:



2. Four (4) children were playing on a see-saw and wanted to see who was the heaviest.

The diagrams below show what happened when they were sitting still:



Which child was the heaviest?

- A - Rita
- B - Melissa
- C - Lindiwe
- D - Ferdza

(2)

3. A group of animals was feeding together on the farm; they were then disturbed and this is a sketch of the tracks in the sand they left:

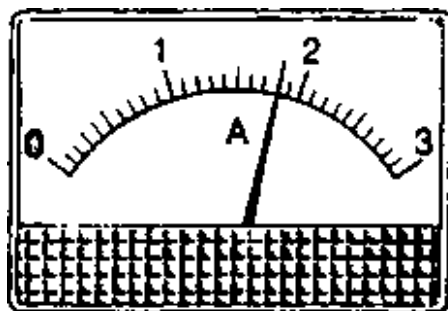


Which were the animals which produced the tracks above?

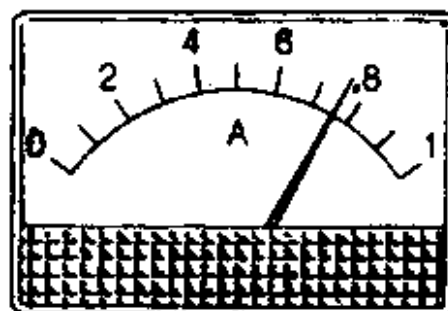
- A - Hen, Cow, Elephant and Human
- B - Human, Hen, Dog and Cow
- C - Dog, Cow, Lion and Pigeon
- D - Horse, Cow, Dog and Hen.

(2)

4. The reading on ammeter X is 1,8 A. What is the reading on ammeter Y?



Ammeter X



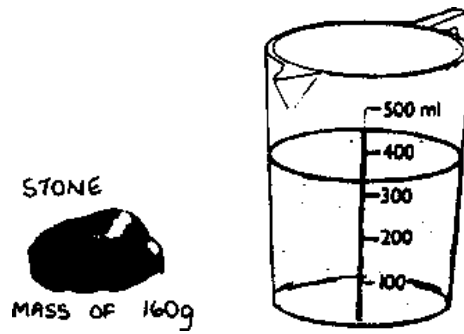
Ammeter Y

- A - 6,75 A
- B - 7,6 A
- C - 0,72 A
- D - 0,76 A

(2)

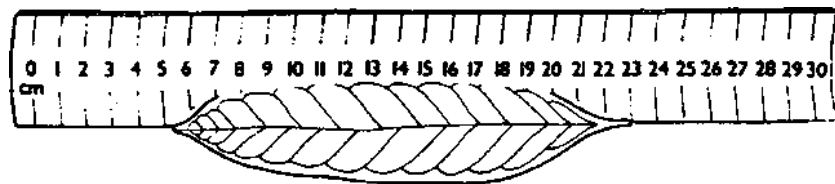
5. You put the stone in the jug of water. This makes the water rise to the 500ml mark. What is the **volume** of the stone? Choose A, B, C or D.

- A - 160 g
- B - 340 ml
- C - 160 ml
- D - 500 g



(2)

6. What is the length of the leaf?

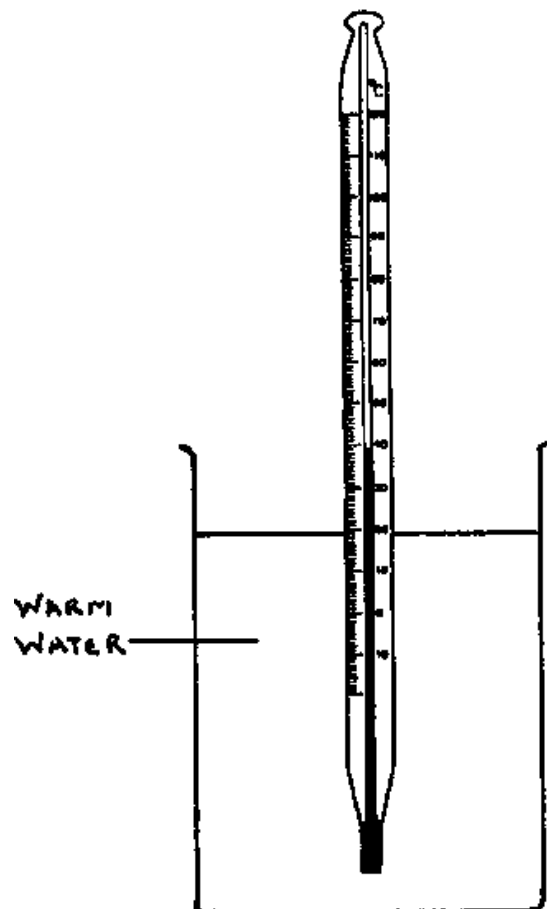


- A - 23 cm
- B - 17,7 cm
- C - 16,4 cm
- D - 21,5 cm

(2)

7. What is the temperature of the water?

- A - 49° C
- B - 41° C
- C - 40° C
- D - 39° C

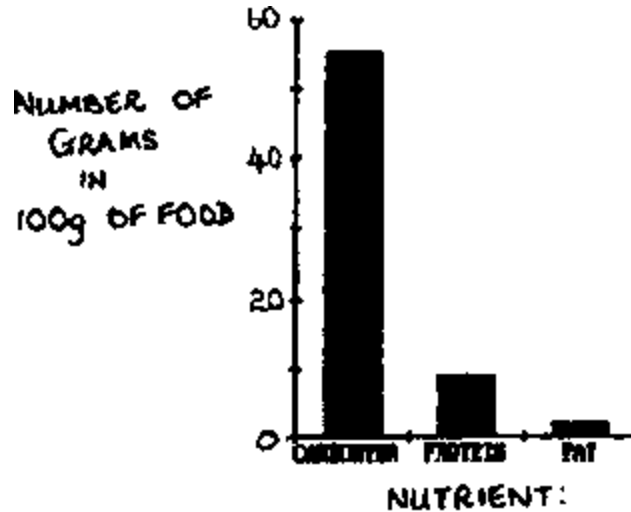


(2)

8. The table below gives the nutrients present in 100g of various foods:

FOOD:	NUMBER OF GRAMS OF NUTRIENTS IN 100g OF THAT FOOD		
	CARBOHYDRATES	PROTEIN	FAT
Wholemeal Bread:	46	10	3
Boiled Potatoes:	20	2	0
Potato Chips:	40	4	9
White Bread:	55	9	2

The following graph shows the differing amounts of the nutrients found in one of the foods; **which food does the graph represent?**



- A - Wholemeal Bread
- B - Boiled Potatoes
- C - Potato Chips
- D - White Bread

(2)

9. The table below shows some South African indigenous (natural) plants and it shows the months in which these plants produce flowers:

PLANTS:	SUMMER			AUTUMN		WINTER			SPRING		SUMMER	
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Corai Tree						_____	_____	_____	_____	_____	_____	_____
Cabbage Tree			_____									
Kareeboom	_____											_____
Suikerbossie	_____											
Kraaibos				_____	_____	_____	_____	_____	_____	_____	_____	_____
Dandelion								_____	_____	_____	_____	_____

NOW ANSWER THESE QUESTIONS:

9. Which plant has flowers the longest?

- A - Kareeboom
- B - Suikerbossie
- C - Dandelion
- D - Kraaibos

(2)

10. Look at the plant you chose in your answer to (9) above. For how long does it produce flowers?

- A - 7 months
- B - 6 months
- C - 8 months
- D - 5 months

(2)

11. Which season has the most plants producing flowers?

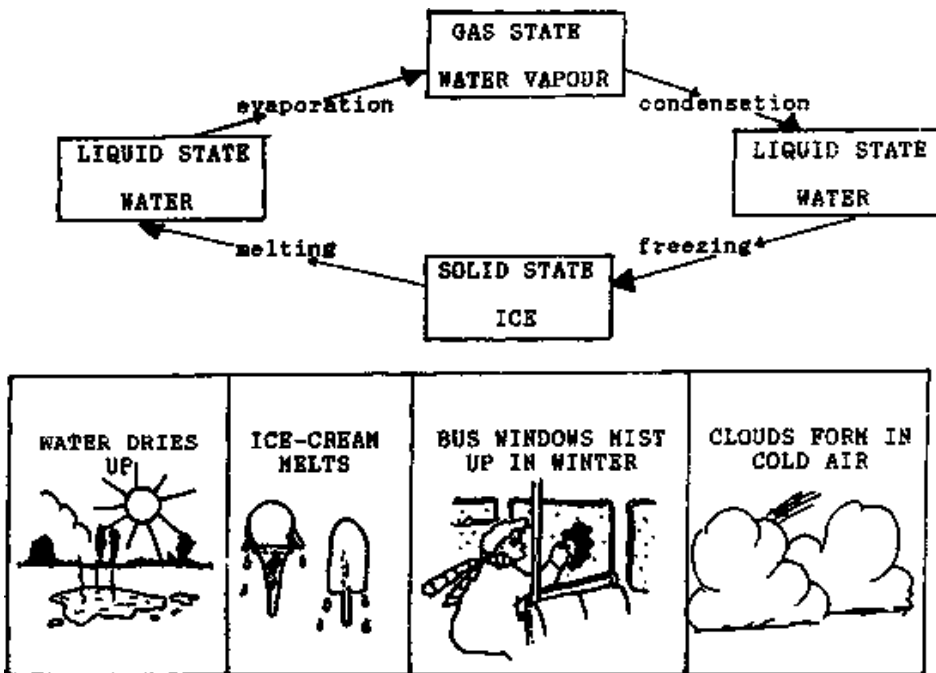
- A - Spring
- B - Summer
- C - Autumn
- D - Winter

(2)

22 Marks

Questions 12 and 13 are to be answered in the blue booklet; use the lines and graph provided.

12. Study the following diagram and pictures, and answer the questions which follow:



12.1 Name the phase change (evaporation, melting, condensation or freezing) for each of the 4 diagrams.

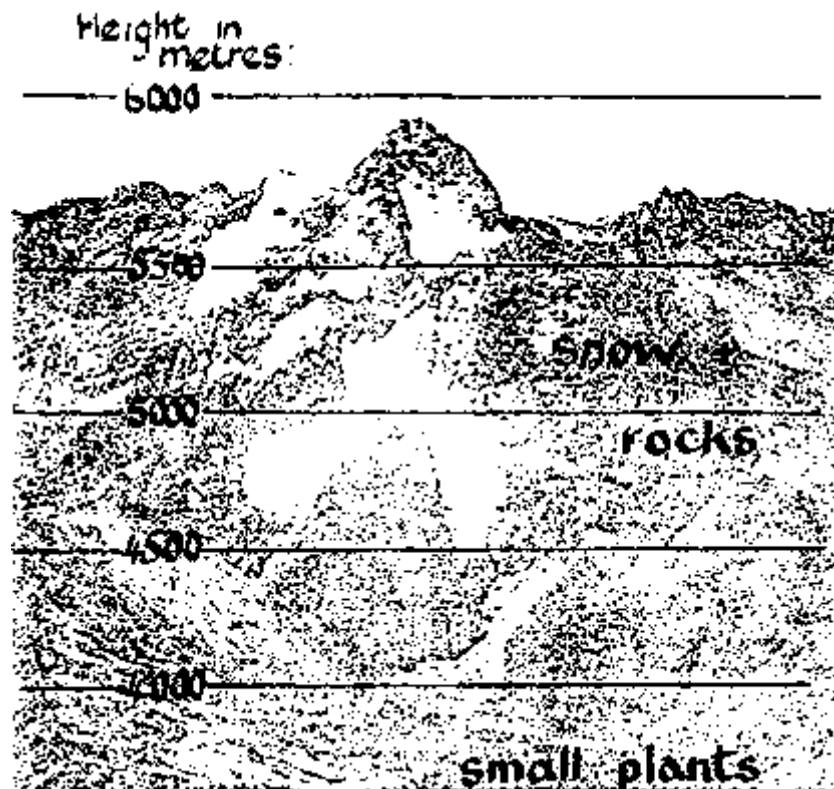
(4)

12.2 Give 2 more examples of substances changing phase.

(2)

13. Study the picture of Mount Kenya and the table of information below. Then answer Question 13.1 to 13.5.

This picture shows Mount Kenya. Altitudes have been drawn on the picture. (Altitude means the height above sea level)



Mount Kenya

Height above Sea Level:	Boiling Temperature of Water:	Atmospheric Pressure:
6000 m	80° C	47 kPa
4000 m	88° C	60 kPa
2000 m	93° C	77 kPa
Sea Level	100° C	100 kPa

13.1 To boil an egg very hard, the temperature of the boiling water must be higher than 88° C; if mountain climbers find that they cannot boil eggs hard, at what height would they be?

(1)

13.2 How high is the mountain? Look at the picture and give the most accurate answer you can.

(1)

13.3 Why would a mountain climber have difficulty breathing when he gets to the top of Mount Kenya?

(3)

(Support your answer by mentioning one observation from the picture of Mount Kenya).

13.4 Use the data from the table above to draw a graph (on the graph paper in the blue booklet) comparing Altitude and Boiling temperature of water.

(5)

Decide on a heading for this graph and write it on the line provided.

(1)

13.5 Use your graph to work out what the boiling temperature of water would be at 3000 metres (height above sea level). (Write your answer in the space provided in the blue booklet).

(1)

TOTAL MARKS FOR SECTION A: 40 Marks

Examination No. _____

**STANDARD 7 COMBINED SCIENCE EXAMINATION
SEPTEMBER 1993**

ANSWER SHEET FOR SECTION A

Mark the appropriate letter with a cross

Question 1	A	B	C	D
Question 2	A	B	C	D
Question 3	A	B	C	D
Question 4	A	B	C	D
Question 5	A	B	C	D
Question 6	A	B	C	D
Question 7	A	B	C	D
Question 8	A	B	C	D
Question 9	A	B	C	D
Question 10	A	B	C	D
Question 11	A	B	C	D

(11 X 2 = 22 marks)

QUESTION 12

12.1

- a. Water dries up: _____
- b. Ice cream melts: _____
- c. Bus windows mist up: _____
- d. Clouds form: _____

(4)

12.2 _____

QUESTION 13

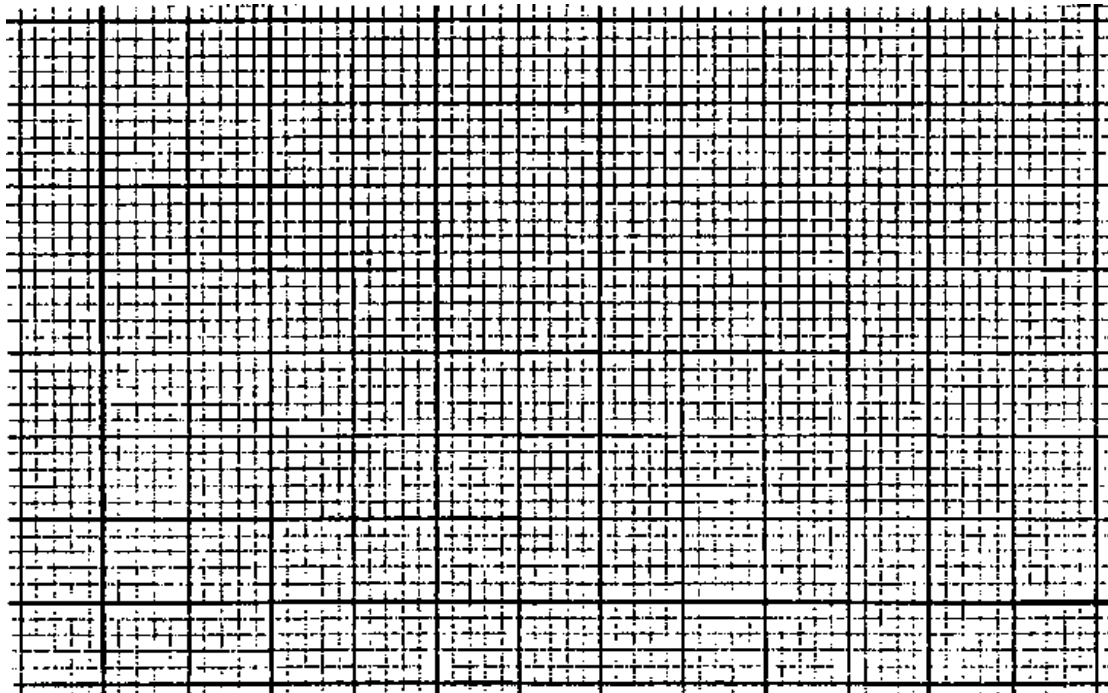
13.1 _____ (1)

13.2 _____ (1)

13.3 _____ (3)

13.4

Heading for graph: _____ (1)



(5)

13.5 Boiling temperature of water at 3000m is about _____

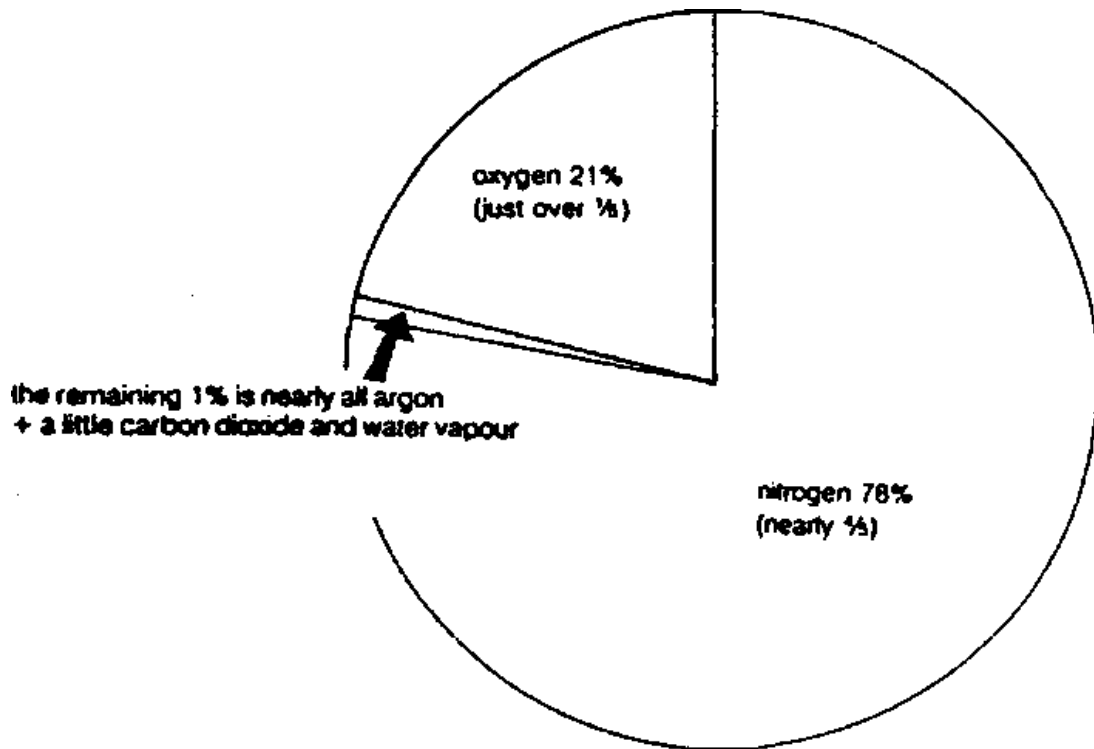
(1)

SECTION B: "THE AIR AROUND US" (35 marks)

Answer this section on the lines (and in the spaces) provided on this Question Paper.

READ THE FOLLOWING INFORMATION CAREFULLY AND THEN ANSWER THE QUESTIONS WHICH FOLLOW:

The following pie chart show the gases which make up "clean air" in our Earth's Atmosphere:

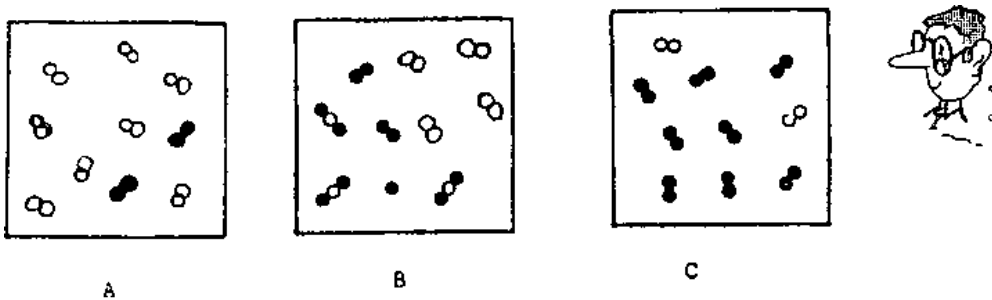


Sadly, much of the air we breathe in is **not** clean; it contains poisonous substances which we call **POLLUTANTS**.

Where do the pollutants come from? They come from factories, power stations and cars. In the past 100 years, all countries have become more industrialised. There are more factories and power stations which burn coal and oil. There are more and more cars on the roads; cars burn petrol and blow out waste gases into the air. The countries of the world burn almost a billion tonnes of coal, oil and gas each year.

NOW ANSWER THESE QUESTIONS:

1. Scientists believe that gases are made up of tiny particles which we cannot see with our eyes; try to imagine what gases look like if **you could** see these tiny particles - **they would look something like this:**



- Key
- = nitrogen particles
 - = oxygen particles
 - = carbon dioxide particles
 - = noble gas particles

1.1 Which of the pictures above would best represent a small quantity of CLEAN AIR. (A, B OR C)?

(1)

1.2 Explain fully why you chose the above picture to represent clean air.

(3)

1.3 What does the word "**POLLUTANT**" mean?

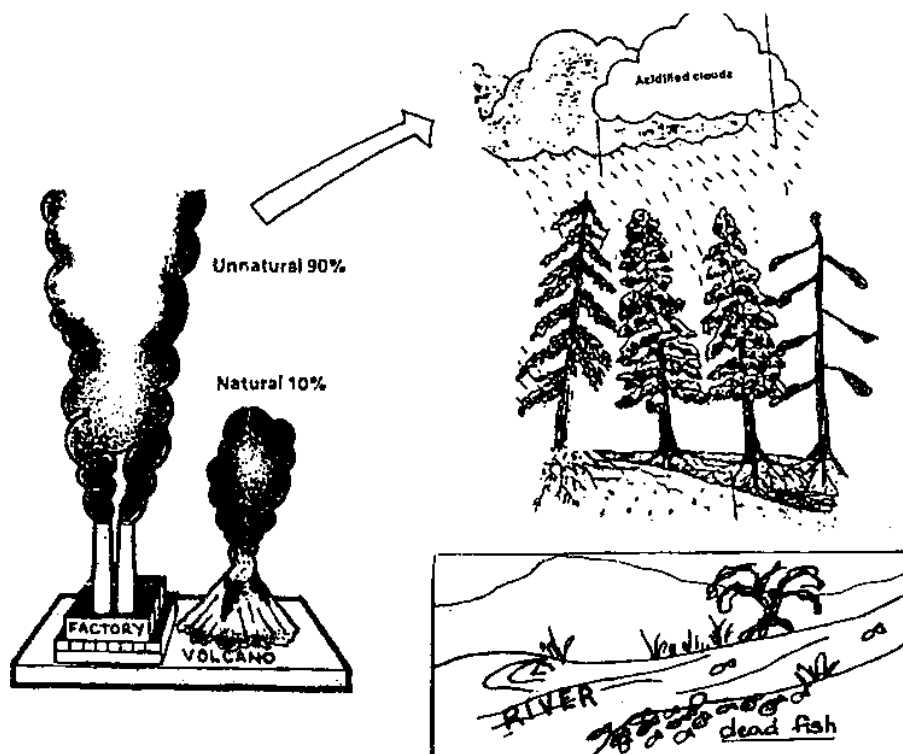
(1)

1.4 Explain why atmospheric pollution has increased over the years

(2)

7 Marks

2. Study the following diagram. The diagram summarises the effects of acid rain:



Acid Rain

In nature, volcanoes and lightning form sulphur dioxide and nitrogen oxide gases. Factories produce 9 times more sulphur dioxide and nitrogen oxide gases than nature produces. Nitrogen oxide and sulphur dioxide gases rise into the air. When they meet the moist air, the gases dissolve to produce sulphuric and nitric acids. The clouds become strongly acidified and these clouds produce acid rain.

QUESTIONS:

2.1 State two problems caused by acid rain which are shown on the diagram on page 16.

(2)

2.2 Where does the acid rain come from? What are its major sources?

(2)

2.3 Name two oxides that cause acid rain:

(2)

6 Marks

3. Some people think acid rain stops seeds germinating, but other people disagree. An experiment is a fair way to test an idea. You have been asked by your teacher to design a good experiment to investigate the effects of acid rain on the germination/growth of seeds. You can only use the apparatus and materials given below:

- 2 saucers/small dishes
- cotton wool
- tap water
- an acid solution
- a measuring cylinder
- a packet of carrot seeds

3.1 Describe step by step the method you would use in doing this experiment:

(5)

3.2 Some students did a similar experiment with carrot seeds. They found that fewer seeds germinated in the acid solution than in the water. The following are some of the conclusions

different students reached:

- | |
|--|
| A. Acid rain affects the germination of all plant seeds. |
| B. Acid rain affects the germination of carrot seeds only. |
| C. The acid used in this experiment affected the germination of carrot seeds. Similarly, acid rain would affect the germination of carrot seeds. |

3.2.1 Which one of these conclusions do you think is the best one?

(1)

3.2.2 Explain why you chose the above conclusion.

(3)

9 Marks

4. "AIR POLLUTION IS A BIG CHILD-KILLER"

Air pollution is a big factor in the deaths of many South African children under the age of five, claims the Medical Research Council.

Dr Von Schirnding, one of their researchers, said that:

"Outdoor pollution levels in Soweto, when last monitored in 1986, were found to be higher than the internationally acceptable standard and it is likely that the problem had worsened since."

She added that the domestic consumption of coal in Soweto remains high and that children in homes where coal stoves are used are inhaling sulphur dioxide and coal dust particles which could be damaging their health.

(Extract from an article printed in the Star, 22/8/1990)

Having read the above article, a group of students at the Lilian Ngoyi Secondary School decided to carry out a survey about the effects of air pollution on children in their own area.

The school is in Tembisa, a large township on the East Rand, close to an industrial area with many chemical factories.

The table below shows the results of their study:

POLLUTION FACTOR: This tells you how serious the air pollution is (e.g. Factor 1 - not too dirty; Factor 10 - very dirty)

Month:	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Pollution Factor	3	3	3	4	7	9	9	10	8	5	4	2
Number of children with lung sickness	4000	4000	9000	10000	20000	25000	25000	30000	25000	12000	7000	3000

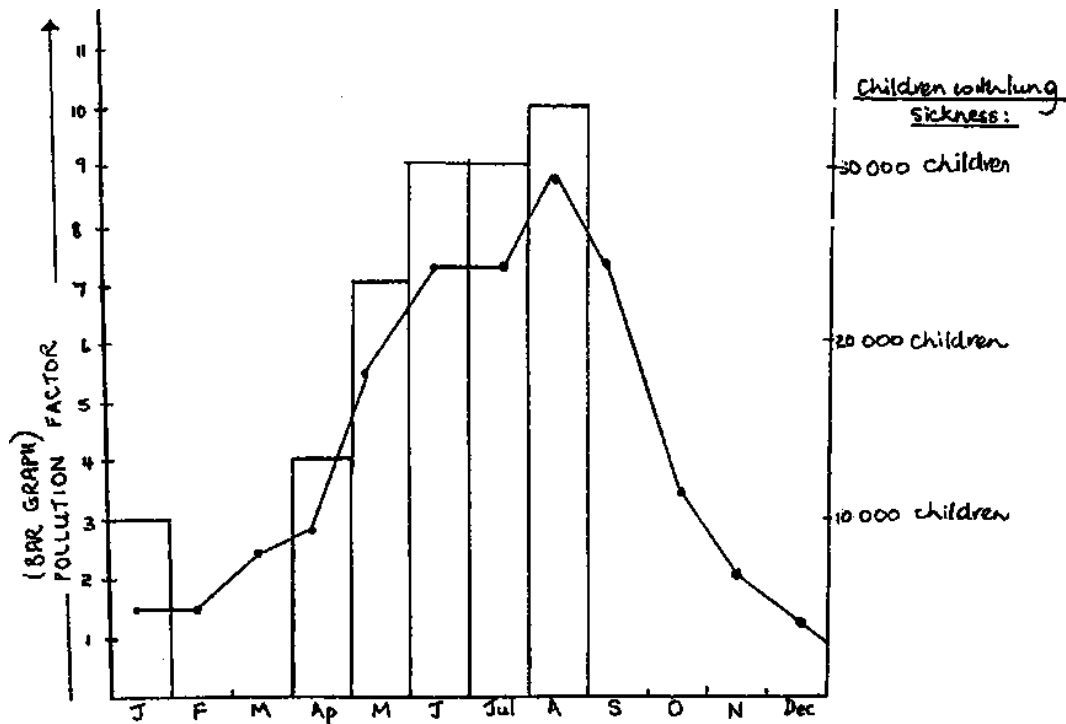
QUESTIONS

4.1 A hypothesis is an **idea or test question** which we can check scientifically. Suggest an hypothesis which could have been made by the students at the start of their research.

(2)

4.2 Using data from the table on the previous page complete the following ar graph (3)

[**Note:** This is 2 graphs; the Bar Graph shows how serious the pollution factor is. The line graph has been drawn on top of the Bar Graph - this shows how many children had lung sickness].



ATMOSPHERIC POLLUTION FACTOR IN TEMBISA IN 1991 (bar graph) associated with CHILDREN WITH LUNG SICKNESS (line graph)

4.3 Which month has the highest pollution factor?

(1)

4.4 Can you suggest a reason for the increased pollution factor during those months you named above?

(1)

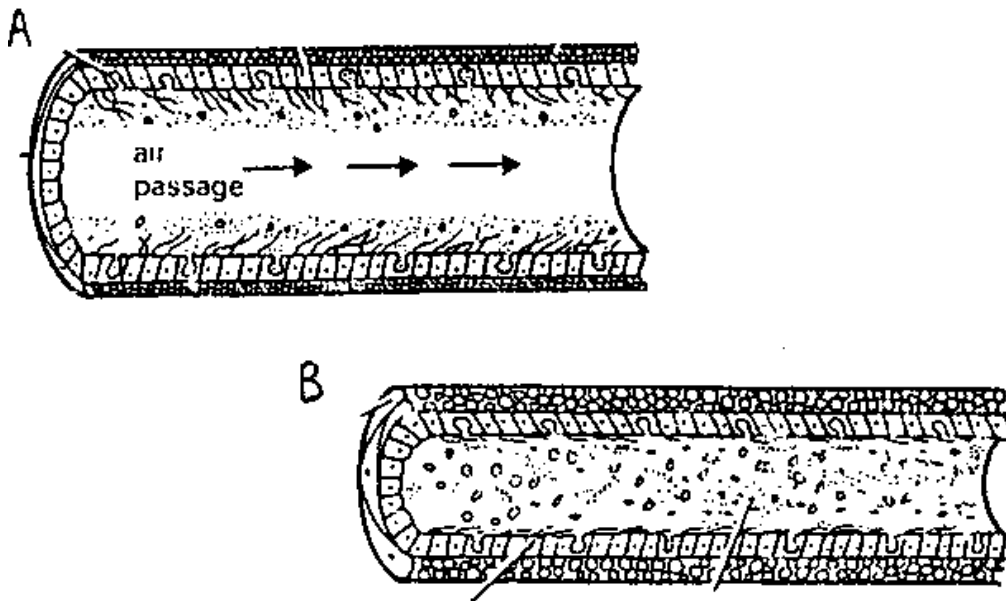
4.5 If 50 000 children live in Tembisa, using data from the table of results, calculate the % of children with lung sickness when the pollution factor was 10.

ANSWER: _____

(2)

CALCULATION: _____

5. The following are diagrams of air tubes found in children's lungs:



This is how air tubes look when they have been cut open (dissected) - they are much smaller than shown in these pictures!

5.1 Complete the following table by writing in the main differences between the two tubes.

(2)

Air Tubes	Tube A	Tube B
Difference 1		
Difference 2		

5.2 Which of the above tubes (A or B) belongs to the sick child?

(1)

6. Suggest a way in which the pollution problems affecting the health of the children of Tembisa can be solved or improved.

(1)

TOTAL MARKS FOR SECTION B: 35 Marks

3.7. Swaziland

3.7.1. Overview

End of Primary School Examination

1. **Title of examination:** Swaziland Primary Certificate (SPC)
2. **Amount of fees charged:** ≈ US\$ 10
3. **Examination after years in primary school (6, 7, 8 years):** 7 yrs
4. **Children's entry age in primary school:** 6 yrs
5. **Number of pupils sitting examination in 1994:** 17,888
6. **Examination subjects offered:**
 - 5 compulsory subjects in 9 papers:
 - Science (2 papers)
 - Mathematics (2 papers)
 - English (2 papers)
 - Siswati (2 papers)
 - Social Studies (1 paper) (incl. History, Geography, Civics)
 - In addition 2 optional subjects are offered with one paper each:
 - Agriculture
 - Home Economics
7. **Language of examination:** English (except for Swazi language paper)
8. **Institution setting the examination questions:** Swaziland Examinations Council
9. **Have there been any reforms in the examination questions?** Yes
 - When? (year)** 1970
 - What kind?** Science paper removed from a General Paper.
10. **Stages of development of examination questions (please describe):**
 - Setters' workshop is organized and they are trained through presentation.
 - Setters write items which are shredded at the workshop.
 - Shredded items are moderated and then compiled for pre-testing.
 - Pre-tested items are then analysed and some items may be removed.
 - Items are banked for use when required.

11. **Type of examination questions and distribution of different kind of questions.** Partly multiple-choice, partly structured questions.
12. **Is continuous assessment incorporated in the final examination?** Yes []
No [x]
13. **Are examination items pretested?** Yes []
No [x]
14. **Which professional groups are involved in setting the examination questions?**
- Primary school teachers
 - School inspectors
 - Tutors of TTCs
 - University lecturers
 - Curriculum designers
15. **Are the same professionals who set the examination questions involved in marking papers?** Yes [x]
No []
16. **How are examination results & used for improving teaching in** Reports written at the end of the marking exercise:
- help in-service specialists to organize regional workshops for the teachers on the major problematic areas;
 - help curriculum designers to review their teaching materials;
 - for administration purposes inspectors visit weak schools.
17. **To what other uses are the examination results put?**
- Selection purposes.
 - Certification.
 - For administration to look into school situations.
18. **Main problem with Primary School Leaving Examinations?**
- Distribution of examination papers.
 - Invigilation problems.
 - Security problems.

3.7.2. Examination and Continuous Assessment in Swaziland

by Jabulisile Fakudze/Valencia S. Simelane/Evart V. Dlamini

Classroom level examinations in primary schools in Swaziland are not administered on a consistent or systematic basis. Although teachers are expected to assess their students regularly this is determined by the individual teacher. The only tests provided to teachers are two or three questions inserted at the end of each unit of curriculum materials. Since a student's score in the teacher's record book is not based on a common measure, it is impossible to ascertain comparisons across classrooms or schools. The current system of classroom testing cannot be relied upon to provide meaningful hints for either instructional or management purposes.

External examinations are a key feature of the educational system in Swaziland. There are three such examinations:

- The Swaziland Primary Certificate Examination taken at the end of primary schooling (Grade 7)

- The Junior Certificate Examination taken at the end of Junior Secondary Education (Form 3) and
- The Cambridge Overseas Certificate Examination taken two years later (Form 5) at the end of Senior Secondary School.

All the examinations are subject examinations. Examinations are set on a series of curricular areas.

The Swaziland Examination Council is responsible for all aspects of the Primary and Junior Certificate Examination: registration of students, preparation of examination papers, printing and distribution of papers, appointment of supervisors (teachers in their own school, but not in their own subjects), appointment of markers, organization of meetings during the marking process, preparation and publication of the results.

The day-to-day running of the examinations is the responsibility of the Swaziland Examinations Council. It consists of eleven members made up of the Principal Secretary of the Ministry of Education, the Director of Education and representatives of headmasters, teachers, inspectors, and the University. It appoints moderators and examiners who set examination papers.

Science examiners and moderators are recommended by the science panel made up of the senior science inspector, Swaziland Science Teachers' Association members, training college lecturers, national curriculum designer, experienced teachers, University staff and science coordinators' representatives.

The chosen examiner and moderator sign a contract of two-three years with the Examination Council. The examiner then sets two papers. The first paper is a multiple-choice type, consisting of 40 questions which are answered in 1 1/2 hours. When setting, the examiner refers to the science syllabus, pupil's books, teachers' guides and other relevant materials. A table of specification is essential when setting the multiple-choice items. It is drawn up by writing unit topics covered from grade 4 to 7 in columns and essential skills in rows, e.g. facts, classification, observation, measurement, calculation etc. For each question set, a tick is put in the appropriate space. The ticks are added in rows and columns to ensure that the questions consist of evenly distributed unit topics and skills.

The second paper consists of six questions carrying 10 marks each. Again, to ensure that the questions cover the syllabus adequately, the questions are structured and mixed. That is, Question 1 a) could carry 6 marks on plant-related questions and part b) could carry 4 marks on animal-related questions. The candidates answer both question papers.

The examiner then hands over the question papers to the moderator. The moderator writes his general remarks about the papers. The moderator's report and papers (questions) are taken to the examiner. The examiner then makes any necessary changes and the papers are finally taken to the Examination Council for printing. Once printed the Exams Council takes the draft papers to the examiner. The examiner reads through all the pages signing each and every page. The draft is then taken to the Exams Council to be sent for printing again. If there were a number of mistakes in the first draft, the second draft is given to the examiner again for approval. The final draft is kept by the Exams Council for distribution to schools via the District Education Office.

Final examinations are supervised by appointed teachers in their own subject (but not in their own schools), retired teachers and in some cases church leaders.

The Examination Council appoints markers with the help of inspectors, about six from each of the four districts. The marking exercise is carried out in December two weeks before schools close. The examiner, together with the moderator, supervises the marking exercise. The markers, examiner and moderator, after this exercise, are paid by the Examination Council through funds generated by pupils' examination fees.

General analyses of performance in examinations are carried out and reports prepared on the basis of these analyses. In the past, more detailed item-analysis information was prepared for some subject areas on the machine scoring of answers. This, however, involved too many errors and had to be discontinued.

Overview of 1993 Results

About 16,789 students sat for the 1993 Swaziland Primary Certificate Examination, out of which 14,224 passed and 2,565 failed the examination. The pass rate was 84.72% which shows an increase of 0.4% from the 1992 pass rate.

Subject	A	B	C	D	E	F	PASS	%	FAIL	%
English	288	1714	3225	3657	5340	2565	14224	84.72	2565	15.28
Math	520	1473	2790	3400	6123	2484	14306	85.21	2484	14.79
Siswati	453	1363	3934	3682	5796	2269	14328	86.33	2269	13.67
Science	440	1443	3145	3808	5602	2251	14438	86.51	2251	13.49
Soc. Science	511	1518	2842	3639	5625	2654	14135	84.19	2654	15.81
Agric.	243	594	1232	1622	2520	1189	6211	83.93	1189	16.07
Home Ec.	259	683	1360	1549	2927	1082	6778	86.23	1082	13.77
Average								85.30		14.70

The main purpose of the Swaziland Primary Certificate Examination is to select pupils for Secondary Education. An examination is said to be good if it discriminates between lower and upper achievers. The marks are put in a normal curve, the mean is 50 and the standard deviation is 10. The marks are then run in a computer to produce standard scores (z-scores). The lower cut-off point is where $z = 40$. An »A« mark is obtained by a student who scores at least two standard deviations above the mean. Ideally one expects plus or minus 84% students to pass the examination.

This should give a picture of how students should pass. The overall performance is categorised into three.

- An aggregate of »C« or better is a first class,
- an aggregate of »D« is a second class pass,
- an aggregate of »E« (40-49%) is a third class pass.

A similar situation prevails at Secondary. At the Junior Certificate Examinations there is selection for O Level. The examinations are used as a screening instrument. The standard deviation at Junior Certificate is 15 and the mean is still 50, but the lowest cutoff point is still 40%.

The Science Results for 1992 and 1993

In 1992, 15,916 students registered for the science examination, 13,666 of these students passed, 2,250 failed. The passes can be classified as follows:

A	B	C	D	E
424	1307	2925	3760	5249

The numbers of failures also include pupils who did not sit for the examination due to various reasons, some died, others dropped because of pregnancy, others due to financial constraints. The pass rate was 85.86%.

In the 1993 examination there were 16,689 pupils who registered for Science and 14,438 passed. The passes can be classified as follows:

A	B	C	D	E
440	1443	3145	3808	5602

The passes indicate a pass rate of 86.51% which means that the passing percentage has increased by 0.65% when compared to the 1992 pass rate.

Continuous Assessment

The introduction of continuous assessment which is still at project stage was a logical development because it is related to curricula with clearly stated instructional objectives. Actually the introduction of continuous assessment is an important milestone in the development of the education system of the country. Not only will the assessment of the child's work be scientific and comprehensive but provision for remediation is also an integral aspect of the programme.

Continuous assessment is a component of a larger education project providing the technical assistance and resources needed to design and establish a comprehensive system for student's assessment at the primary level. This system ensures detailed feedback to teachers, headteachers, parents and the Ministry of Education (MOE) regarding student achievement in presently two subjects areas, English and Mathematics. Tests are developed at three levels:

1. Lesson level - by teacher
2. Unit level - by teachers
3. End of term level - by the National Curriculum Centre.

It is hoped that this programme will proceed through the first nine years of a Swazi student's education with greater efficiency and leading to reduced repetition and dropout rates and improving quality as evidenced by level of mastery of basic skills to practical real life situations.

Continuous Assessment as piloted in Swaziland is a comprehensive system for measuring students' achievement of the goals and objectives delineated in an educational system's curriculum. It is based on a testing technology called criterion-referenced testing (CRT) which is specifically designed to assess whether or not an individual has learned the skills or knowledge that were taught.

A critical feature of the CRT is the use of item specifications. Item specifications are detailed descriptions of the skills and knowledge to be measured, including allowable content, level of difficulty and test item format. Specifications are developed so that they are consistent with the curriculum.

Criterion-referenced tests are particularly useful for those concerned with monitoring, evaluating, and improving an educational system. They provide information at several levels, each of which has important decision-making implications. For example a test of mathematical skills can tell a teacher whether her instruction has been effective and can pinpoint those students who have not mastered particular skills. Using this information the teacher can decide whether to reteach the lesson or move to the next competency area and provide additional instruction only to those who did not learn the skill to a sufficient level of mastery.

Swaziland has only recently started continuous assessment implementation. However, this innovative approach is not without problems. The large numbers of primary school students and teachers' lack of understanding of the main features of assessment theory are the major constraints to implement continuous assessment successfully.

3.7.3 Swaziland Primary Certificate Examination 1994 - Science/Paper I & II

SWAZILAND MINISTRY OF EDUCATION
SWAZILAND PRIMARY CERTIFICATE
EXAMINATION, 1994
SCIENCE - PAPER I

THURSDAY, NOVEMBER 17th - 08:30 a.m. - 10:00 a.m.

TIME:	1½ HOURS	TOTAL MARKS:	40
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CENTRE NUMBER:	
-----------------------	--

CANDIDATE'S NUMBER	
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INSTRUCTIONS:

1. Answer all questions.
2. Each question has four (4) answers to choose from but only one of them is correct. Circle (O) the letter of the correct answers as shown in the example below.
3. Do not circle more than one answer. If you make a mistake cross (X) your first choice and then circle the answer you have finally chosen.
4. Use ink or ball pen.

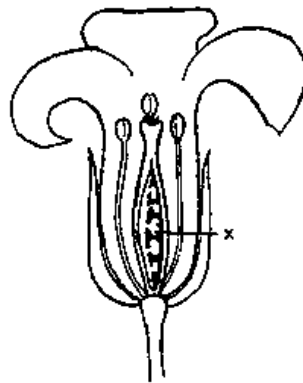
Example

How many eyes does a frog have?

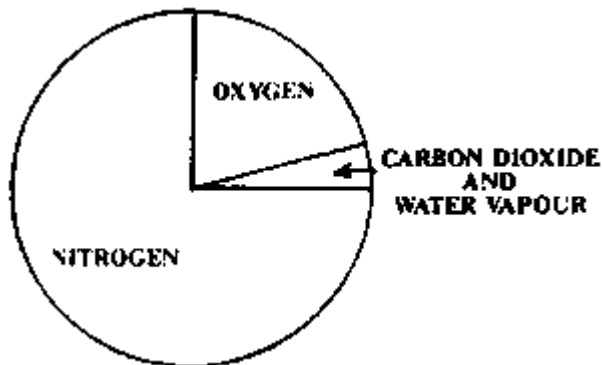
- A. 2
- B. 4
- C. 6
- D. 8

1. Plants with tap roots live better in dry regions because their roots
 - A. store a lot of water.
 - B. reach water in great depths.
 - C. store a lot of food.
 - D. support the stems better.
2. Dzambile's area is rainy, without toilets and has unprotected drinking water supply. People in her place are likely to suffer from
 - A. T.B.
 - B. diarrhoea.
 - C. measles.
 - D. polio.
3. The clouds that usually bring rain are known as
 - A. cumulus.
 - B. stratus.
 - C. cirrus.
 - D. nimbus.

4. The diagram shows parts of a flower. The part marked X is



- A. an ovary.
 - B. an ovule.
 - C. a pistil.
 - D. a stamen.
5. Below are examples of matter except
- A. sand.
 - B. light.
 - C. water.
 - D. trees.
6. The presence of chlorophyll in plants is important for _____ to take place.
- A. respiration.
 - B. photosynthesis.
 - C. pollination.
 - D. transpiration.
7. Which of these is a sexually transmitted disease?
- A. Tuberculosis.
 - B. Bilharzia.
 - C. Cholera.
 - D. AIDS.
8. According to the pie chart, which gas takes up more space in the atmosphere?

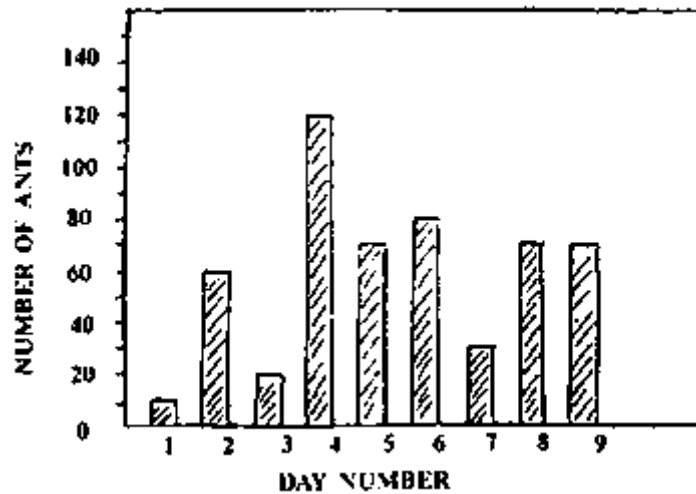


- A. Oxygen.
- B. Nitrogen.
- C. Water vapour.
- D. Carbon dioxide.

9. An object with no definite shape and volume is classified under

- A. solids.
- B. gases.
- C. liquids.
- D. none of the above.

10. Grade 7 pupils of Vulamehlo Primary School studied and counted ants on a 4 square metre piece of land. They kept the following record for 9 days.



Number of Ants on Different Days

On which days did they find less than 50 ants.

- A. Days 1, 3 and 6.
- B. Days 3, 5 and 6.
- C. Days 1, 3 and 7.
- D. Days 2, 4 and 5.

11. The eclipse seen during a cloudless day is known as

- A. sunny eclipse.
- B. lunar eclipse.
- C. solar eclipse.
- D. clear eclipse.

12. A large herd of cattle is kept in a small fenced grassy area for six months. Which of the following is **NOT** likely to happen?

- A. Most vegetation will be eaten up.
- B. Most cattle will be fat.
- C. There will be signs of soil erosion.
- D. There will be very few grasshoppers.

13. Three processes used in treating water in towns are

- A. boiling, washing and irrigation.
- B. settling, filtering and using chlorine.
- C. mixing, dissolving and evaporating.
- D. cleaning, sanding and building canals.

14. A broiler becomes an adult when it is

- A. 6 weeks old.
- B. 7 weeks old.
- C. 8 weeks old.
- D. 10 weeks old.

15. Twenty girls slept in a small air-tight room. The following morning, some of them felt very weak and tired. The reason for this condition was

- A. the enjoyment of a good night's sleep.
- B. tiredness caused by hard work the previous day.
- C. the lack of oxygen due to overcrowding.
- D. their laziness because they knew work must be done.

16. Many animals feed on grass and parts of trees. Therefore the plants are called

- A. consumers.
- B. producers.
- C. good food.
- D. tasty food.

17. Which method of seed dispersal is demonstrated in the diagram. It is seed dispersal by



- A. man.
- B. animals.
- C. wind.
- D. water.

18. The main groups of rocks are

- A. sedimentary, asbestos and coal.
- B. sedimentary, metamorphic and asbestos.
- C. sedimentary, coal and igneous.
- D. sedimentary, igneous and metamorphic.

19. Look at the molars of animals shown in the diagram. Which molar belongs to a flesh eater?



- A. 1.
- B. 2.
- C. 3.
- D. 4.

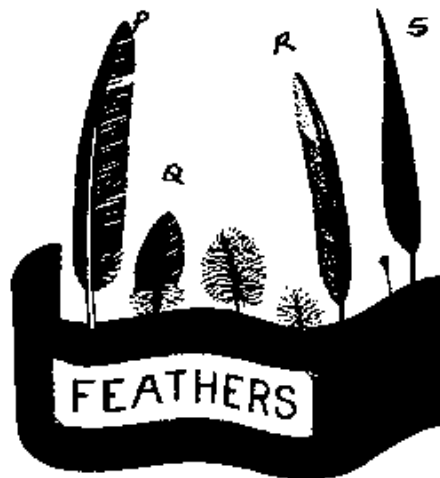
20. Wind speed is measured by a

- A. thermometer.
- B. barometer.
- C. cup anemometer.
- D. wind vane.

21. To make a sugar salt solution, dissolve (1) bottle cap of salt and (8) bottle caps of sugar in 1 litre of water. This measurement is

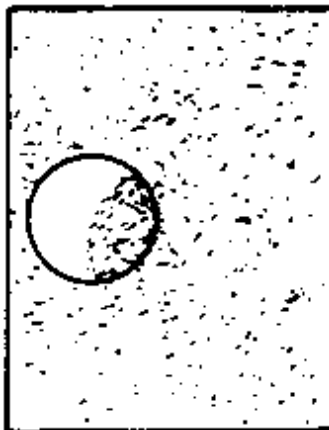
- A. sometimes correct.
- B. correct.
- C. not correct.
- D. correct for children only.

22. The (4)cm feather is



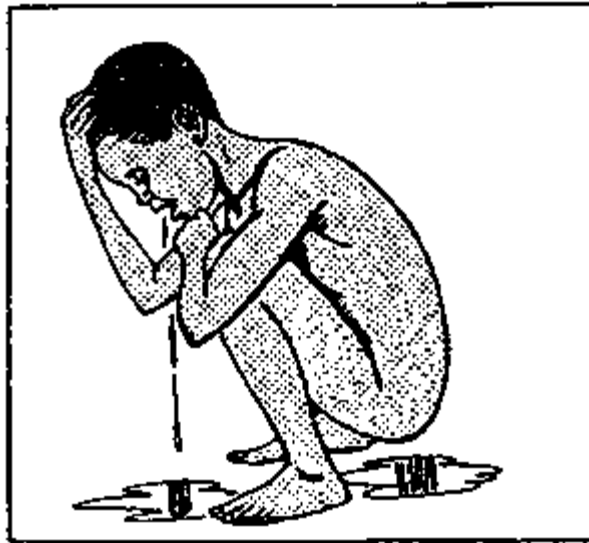
- A. P.
- B. Q.
- C. R.
- D. S.

23. It was full moon on a cloudless night when Thozo saw this shape of the moon. We call it



- A. lunar eclipse.
- B. new moon.
- C. solar eclipse.
- D. surprise moon.

24. Tentele could be suffering from

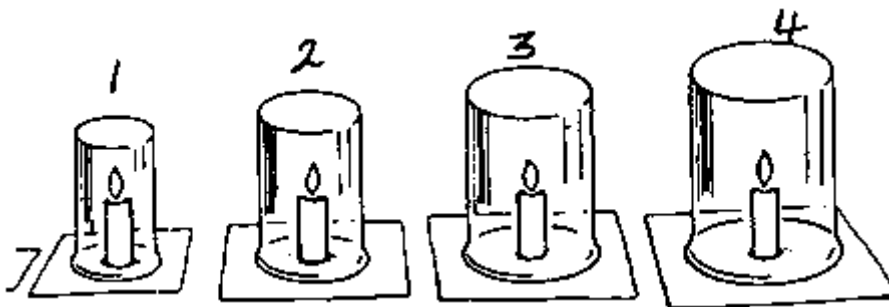


- A. whooping cough.
- B. headache.
- C. cholera.
- D. diarrhoea.

25. Some animals like man are omnivores. Which group of food is good for these animals.

- A. Beef, chicken and rice.
- B. Beef, porridge and lettuce.
- C. Beef, pork and chicken.
- D. Beef, cabbage and spinach.

26. Candles of the same length are covered with glass jars as shown in the diagram. Which candle will go out first?

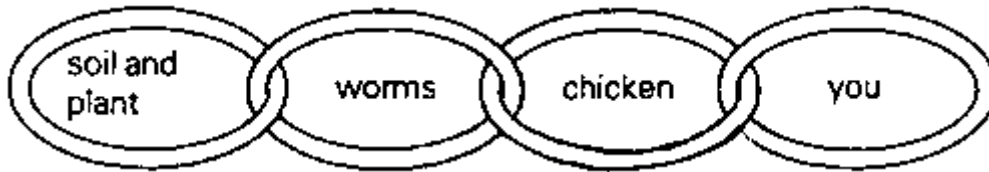


- A. 1.
- B. 2.
- C. 3.
- D. 4.

27. A stone weighs 9 grams. Which weights will balance this stone on the scale?

- A. 3g 4g 3g.
- B. 5g 3g 3g.
- C. 4g 4g 3g.
- D. 3g 3g 3g.

28. Which is the most important part of this food chain?

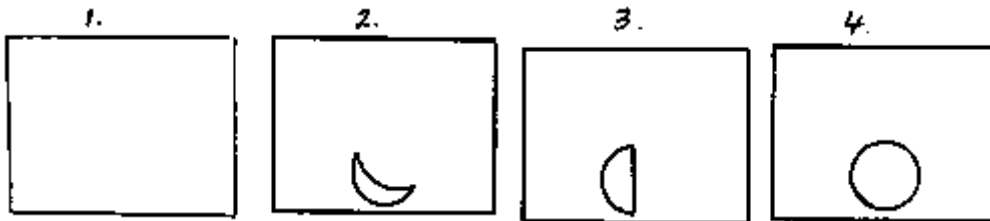


- A. Soil and plant.
- B. Worms.
- C. Chicken.
- D. You.

29. To kill bacteria and germs in water we need to add

- A. salt.
- B. chlorine.
- C. ashes.
- D. vinegar.

30. Which of the above drawings shows a new moon?



- A. 1.
- B. 2.
- C. 3.
- D. 4.

31. Breaking down of food into small pieces within the body is known as

- A. respiration.
- B. excretion.
- C. digestion.
- D. grinding.

32. Which statement explains the picture best?



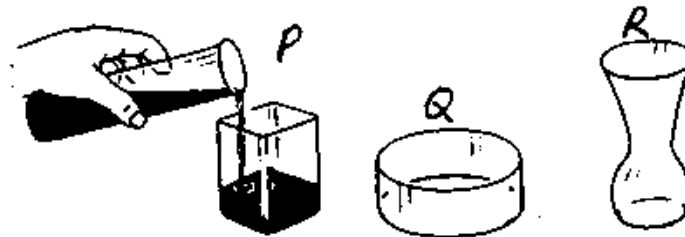
- A. The boy is enjoying a good sleep.
- B. The man is looking at a pencil.
- C. The boy is sick.
- D. The doctor is reading the sick boy's temperature.

33. Look at these clouds. Clouds which show clear and fine weather are



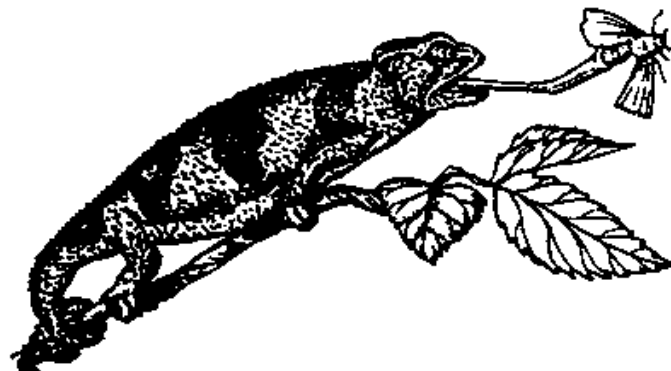
- A. stratus.
- B. cirrus.
- C. cumulus.
- D. none of these.

34. The same amount of water fills each of these containers. The container that holds more water is



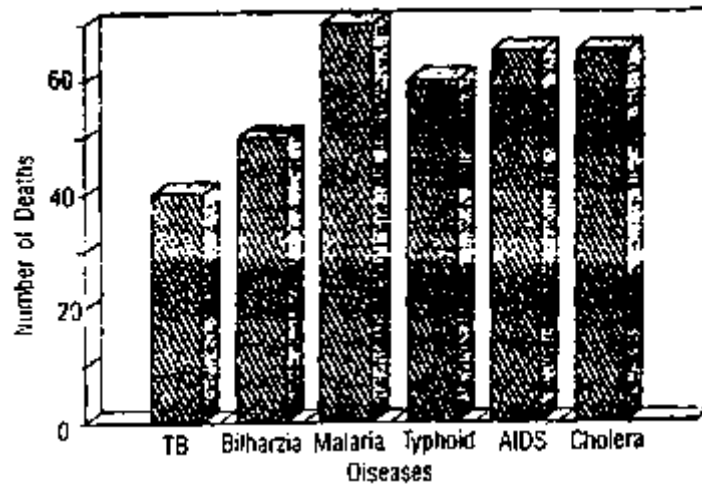
- A. P.
- B. Q.
- C. R.
- D. None of these.

35. Study the feeding habit of a chamelion shown on the diagram, This chamelion is.



- A. a herbivore.
- B. a carnivore.
- C. an omnivore.
- D. a scavenger.

36. Study the bar graph below which shows the number of people who died from various diseases in country X and answer the question that follows.



Deaths by Type of Disease

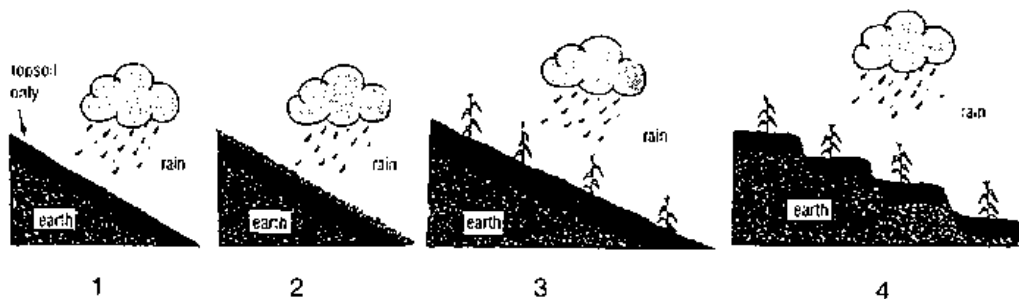
Which of the following is true according to the graph?

- A. Cholera and Tuberculosis (TB) killed 120 people.
- B. Cholera and Malaria killed 140 people.
- C. Malaria and AIDS killed 135 people.
- D. Bilharzia and Typhoid killed 120 people.

37. In the water cycle water changes

- A. just once.
- B. usually two times.
- C. over and over.
- D. four times.

38. Which piece of earth is likely to develop soil erosion faster?



- A. 1.
- B. 2.
- C. 3.
- D. 4.

39. Which of the following can transmit AIDS?

- A. Playing together of boys and girls.
- B. Swimming in the same pool with sick people.
- C. Having sex with someone who has AIDS.
- D. Eating with someone who has AIDS.

40. The best description of water is

- A. that it is colourless.
- B. that it has no definite shape.
- C. that it has no smell.
- D. all of the above.

SWAZILAND MINISTRY OF EDUCATION

SWAZILAND PRIMARY CERTIFICATE EXAMINATION FOR PRIMARY SCHOOLS, 1994

SCIENCE - PAPER II

FRIDAY, NOVEMBER 18th - 08:30 a.m. - 10:30 a.m.

TIME:	2 HOURS	TOTAL MARKS:	60
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CENTRE NUMBER:	
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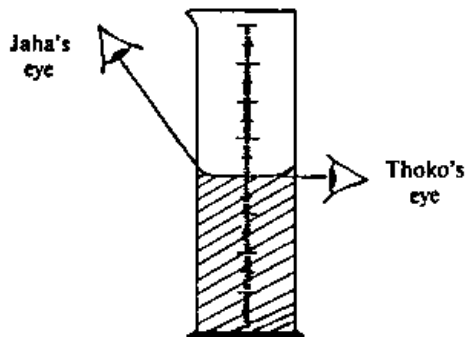
CANDIDATE'S NUMBER	
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INSTRUCTIONS:

1. Answer all questions.
2. Write your examination number in the box above.

QUESTION 1

1. Jaha and Thoko read the volume of water in a measuring cylinder as shown below:



- a) Who is likely to read the correct volume? _____ (1)
- b) Give one reason for your answer in (a) _____ (1)

2. Write the following names of animals where they belong in the table, (lion, rabbit, mouse, man, grasshopper)

HERBIVORE	CARNIVORE	OMNIVORE

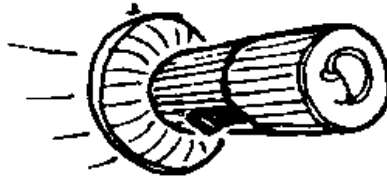
(5)

3. What are the three main food groups that make a balanced diet?

- a) _____ (1)
- b) _____ (1)
- c) _____ (1)

(10)

QUESTION 2



1. The torch above uses electrical energy.

a) Give two kinds of energy given by a torch.

- (i) _____
- (ii) _____ (2)

b) Tona switched on the torch but there was no light. Write three possible reasons for this failure.

- i) _____
- ii) _____
- iii) _____ (3)
- iv) What produces electrical energy in a torch?
_____ (1)

2. Raw water for the Matsapha Water Treatment Plant comes from Lusushwana river.

a) What are the two substances used to purify this water?

- i) _____
- ii) _____ (2)

b) Name two kinds of leaves.

- i) _____
- ii) _____ (2)

(10)

QUESTION 3

Look at the following picture very carefully and answer the questions on it.



a) The animal shown spreads disease-germs. What is it?
 _____ (1)

b) Write two good health habits to be used in this picture?
 i) _____
 ii) _____ (2)

c) Which two diseases could be spread by this animal?
 i) _____
 ii) _____ (2)

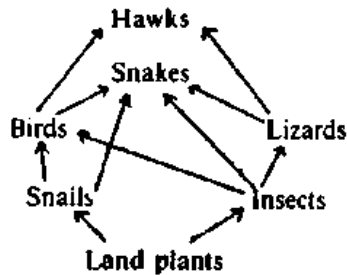
Complete the paragraph below using the following words. Each word is used only once, (loudly, AIDS, live, get, sex and five)

Dzikila was a bad school girl. She had _____ boy friends and had _____ with all of them. When the teacher explained about _____, a disease that a person can _____ by having sex with many people, she cried _____

(5)

(10)

QUESTION 4



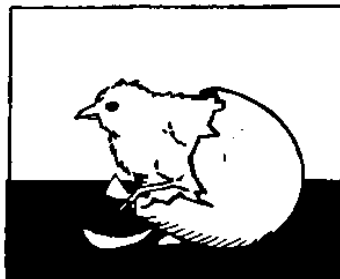
1. This diagram has many food chains. One of them is:

Land plant → snails → Birds → Snakes

Make three other food chains from this diagram?

- a) _____ (2)
- b) _____ (2)
- c) _____ (2)
- d) The producer in these food chains is _____ (1)

2. The drawing below shows a hatching chick.



- a) Fertilization in chickens takes place _____ (1)
 b) The time when the hen sits on its eggs is called the _____ period (1)

3. Name one waste substance excreted through the skin _____ (1)

(10)

QUESTION 5

1. Study the diagram below and answer the following questions.



a) What has happened in this diagram? _____ (1)

b) Write two good health habits that have not been kept.

i) _____ (2)

ii) _____ (2)

2.



a) What part of air does the fire need to keep burning?

b) Which part of the air that can be used to put the fire out? _____ (2)

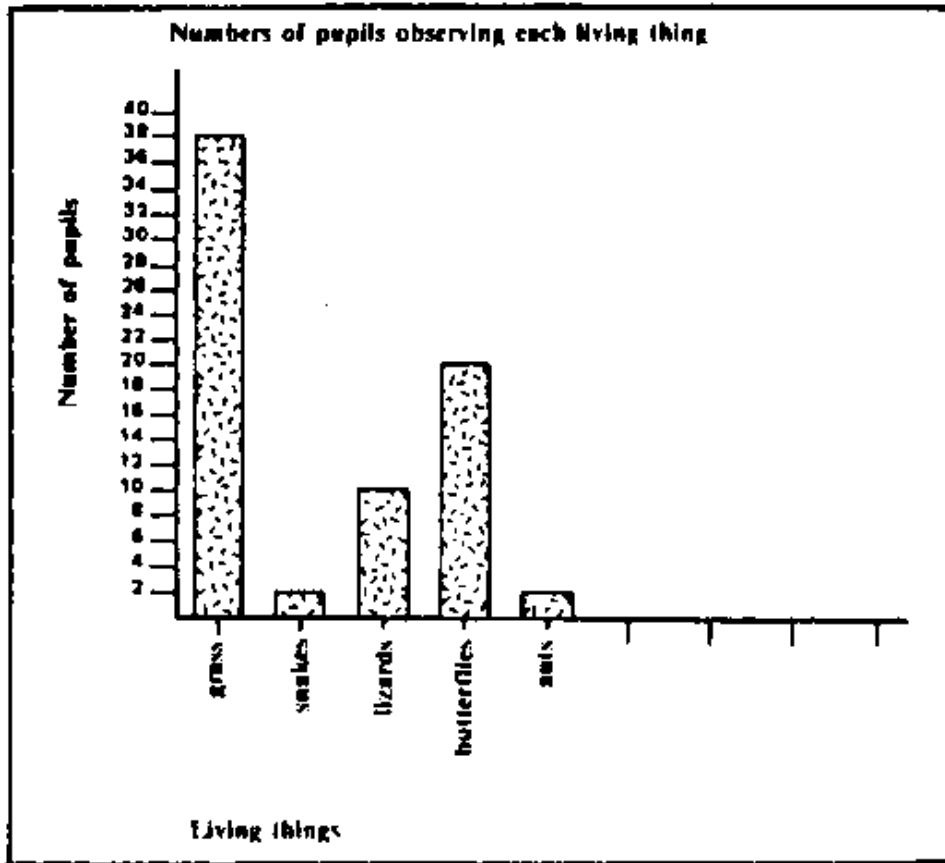
3. Write three functions of roots.

- i) _____
 ii) _____
 iii) _____ (3)

(10)

QUESTION 6

1. Grade 6 pupils drew this bar graph after their field trip. Use it to answer questions (a) to (e) below.



- a) What were the two kinds of living things observed? _____ (2)
- b) Which animals were seen by few pupils? _____ (1)
- c) Which animals were most common in this area? _____ (1)
- d) How many pupils saw animals? Show how you got the answer.
 _____ (3)
- e) Give two examples how living things depend on each other in this area
 - i) _____
 - ii) _____ (2)

The study of living things in their natural homes is called _____ (1)

(10)

3.7.4 Swaziland Primary Certificate Examination 1993 - Science/Paper I & II

SWAZILAND MINISTRY OF EDUCATION

SWAZILAND PRIMARY CERTIFICATE EXAMINATION, 1993

SCIENCE - PAPER I

TUESDAY, NOVEMBER 23rd - 08:30 a.m. - 10:00 a.m.

TIME:	1½ HOURS	TOTAL MARKS:	60
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CENTRE NUMBER:	
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CANDIDATE'S NUMBER	
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INSTRUCTIONS:

1. Answer all questions.
2. Each question has four (4) answers to choose from but only one of them is correct. Circle (O) the letter of the correct answers as shown in the example below.
3. Do not circle more than one answer. If you make a mistake cross (X) your first choice and then circle the answer you have finally chosen.
4. Use ink or ball pen.

Example

How many eyes does a frog have?

- A. 4
- (B.) 2
- C. 3
- D. None

1. Which of these is **not** a characteristic of living things?

- A. Movement
- B. Excretion
- C. Photosynthesis
- D. Respiration

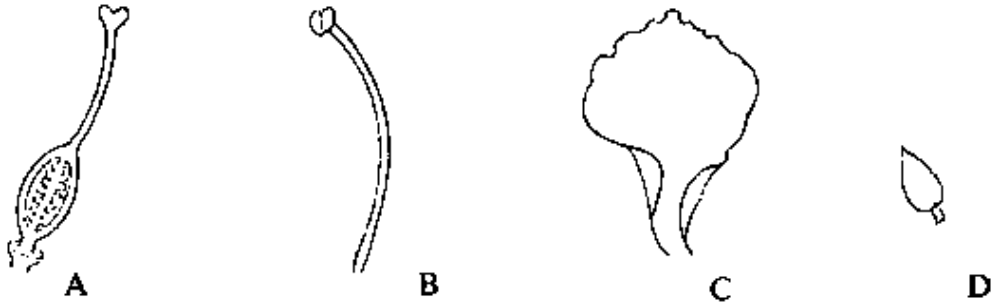
2. Study these two types of leaves below.



The difference between these leaves is that one

- A. is edible and the other is not edible
- B. has parallel veins and the other is net veined.
- C. has been picked from a mango tree and the other has been picked from an orange tree.
- D. one respire and the other does not.

3. Look at these parts of a flower and answer the question below.

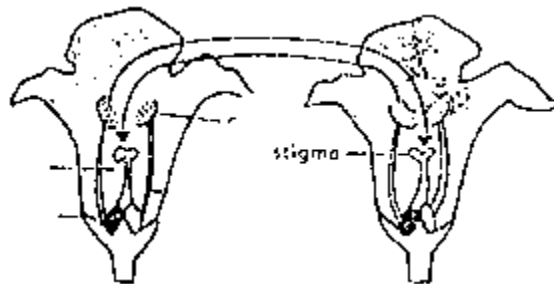


Which of these parts represents the male part of a flower?

4. Animals get more energy when they

- A. sleep
- B. breathe
- C. eat
- D. walk

5. Study this diagram and answer the question below.



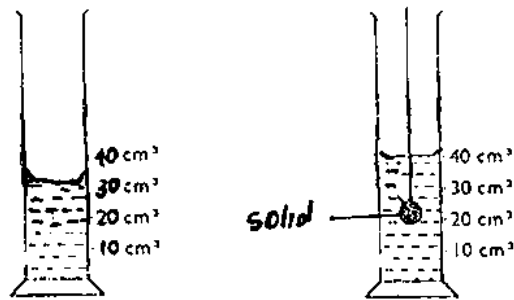
Describe the process that is taking place in this diagram.

- A. Self Pollination
- B. Cross Pollination
- C. Seed dispersal
- D. Fertilisation

6. The time taken by a simple pendulum to complete one swing depends on the

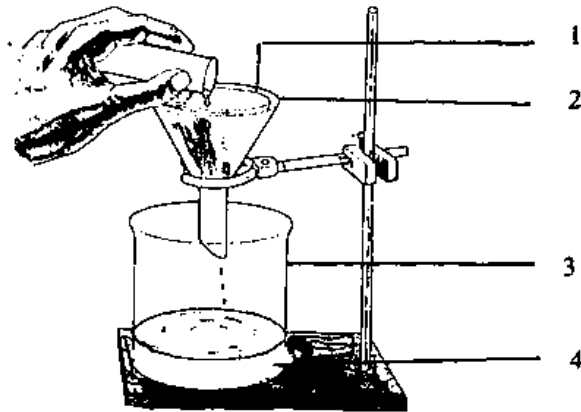
- A. length of the pendulum
- B. mass of its weight
- C. shape of its weight
- D. size of its weight

7. The volume of the solid below is



- A. 10cm³
- B. 30cm³
- C. 40cm³
- D. 55cm³

8. Look at the diagram below and answer questions 8 and 9.



The above diagram shows the process of

- A. filtration
- B. evaporation
- C. condensation
- D. distillation

9. Which number in the diagram shows a filtrate?

- A. 1
- B. 2
- C. 3
- D. 4

10. Which of the following is true about magnets?

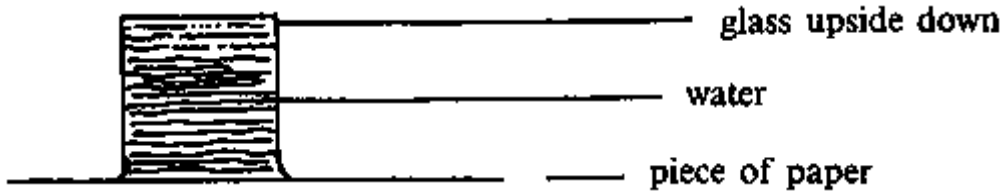
- 1. Like poles repel
- 2. Like poles attract
- 3. Unlike poles attract
- 4. Unlike poles repel

- A. 1 and 3
- B. 2 and 3
- C. 1, 2 and 3
- D. 2 and 4

11. An iron nail is not a magnet because it

- A. will rust
- B. does not attract another iron nail
- C. can be attracted by a magnet
- D. cannot be attracted by a magnet.

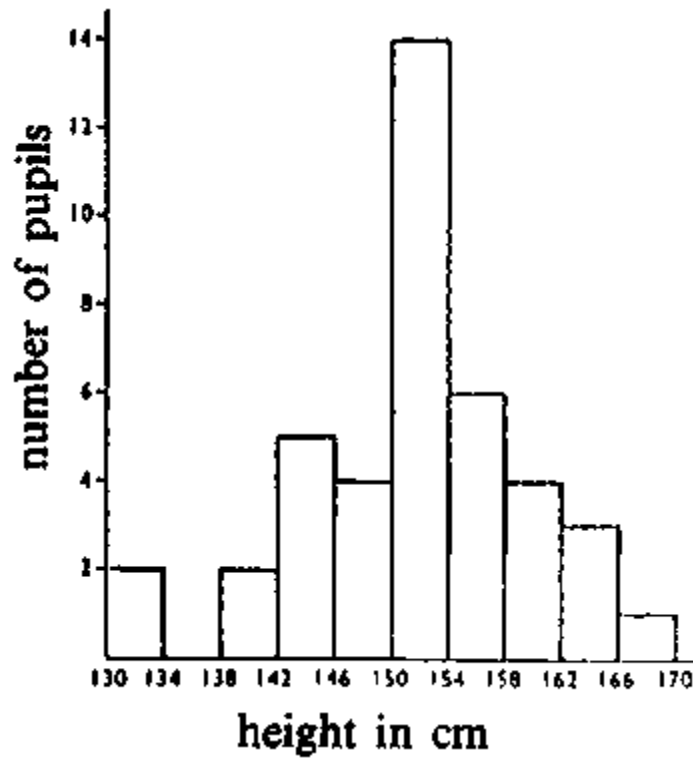
12. A piece of paper stays firmly under an overturned glass full of water that is held up without spilling any drop of water.



This is because

- A. it is wet
- B. the paper is smooth
- C. it is sticky
- D. of air pressure.

13. The graph below shows the heights of the pupils in a class.



How many pupils are taller than 154cms?

- A. 3 pupils
- B. 4 pupils
- C. 6 pupils
- D. 14 pupils

14. What type of food are the following; bread, rice, potatoes, sugar and wheat?

- A. Vitamins
- B. Proteins
- C. Carbohydrates
- D. Fats

15. Which of the following stages represents the correct order of the life cycle of an insect?

- A. Pupa - adult - larva - egg
- B. Egg - pupa - larva - adult
- C. Pupa - larva - egg - adult
- D. Egg - larva - pupa - adult

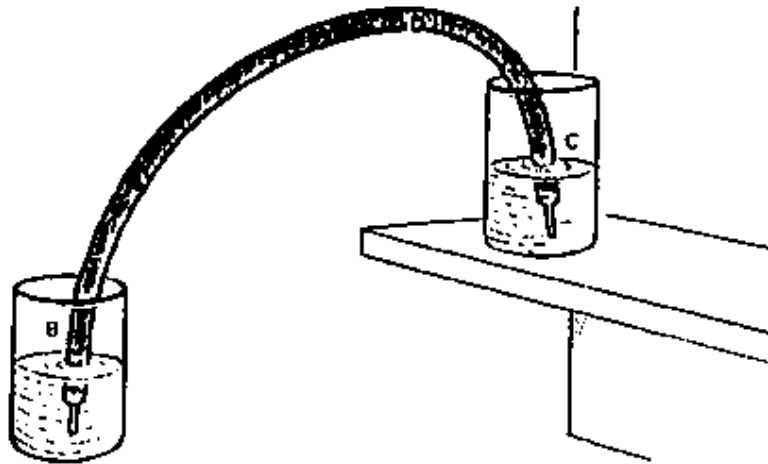
16. The smallest part of matter is

- A. a compound
- B. an atom
- C. a mixture
- D. an element

17. Pick out a non metal

- A. Carbon
- B. Iron
- C. Copper
- D. Gold

18. A siphon is used to suck out water from one container to another.



It works by

- A. using the force of gravity
- B. water pressure
- C. air pressure
- D. expansion of solids.

19. For photosynthesis to take place plants require certain conditions. Pick out one that is **not** necessary.

- A. Sunlight
- B. Oxygen
- C. Carbon dioxide
- D. Chlorophyll

20. All living things are made up of

- A. meat
- B. chlorophyll
- C. organs
- D. cells

21 Heat travels from one end of an iron rod to the other by

- A. convection
- B. absorption
- C. conduction
- D. radiation

22. Sabelo's cow died immediately after giving birth. What must he feed the calf with?

- A. Growing mash
- B. salt licks
- C. milk
- D. sugar solution

23 An example of a substance which is alkaline is

- A. vinegar
- B. lemon juice
- C. soap solution
- D. sugar solution

24. Water is commonly used as a

- A. solute
- B. solvent
- C. solution
- D. mixture

25. Mbokodvo is stung by a bee. Its sting is alkaline. Therefore he has to treat the wound with

- A. water
- B. soap solution
- C. saliva
- D. vinegar

26. Sometimes we feel uncomfortable after eating. This may be due to too much

- A. water in the body
- B. salt in the body
- C. acid in the stomach
- D. food in the stomach

27. This kind of tooth is a

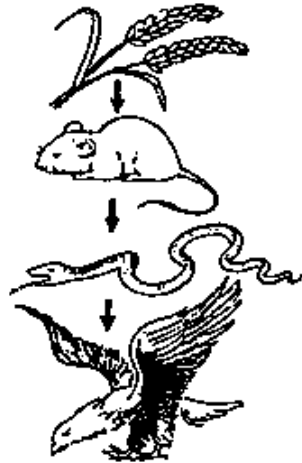
- A. molar
- B. incisor
- C. canine
- D. temporal tooth



28. The animal that feeds on both plants and animals is

- A. a carnivore
- B. a vulture
- C. an omnivore
- D. a herbivore

For questions 29 to 32 refer to the diagram below



29. This is an example of a

- A. food cycle
- B. food chain
- C. food web
- D. food way

30. The producer is a

- A. mouse
- B. plant
- C. snake
- D. eagle

31. The primary consumer is the

- A. plant
- B. snake
- C. mouse
- D. eagle

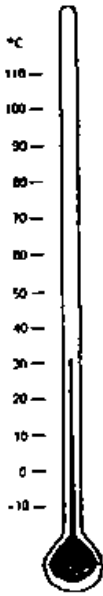
32 The secondary consumer is the

- A. plant
- B. mouse
- C. snake
- D. eagle

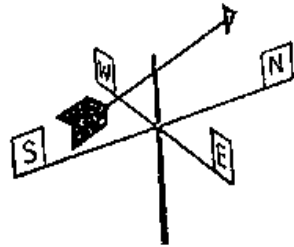
33. Which type of soil is best for growing plants?

- A. Gravel
- B. Clay
- C. Sandy
- D. Loam

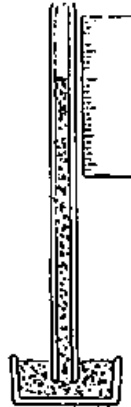
34. Pick the instrument that is used to measure temperature.



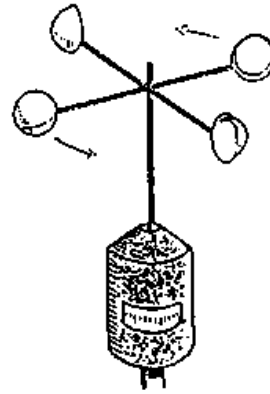
A



B



C



D

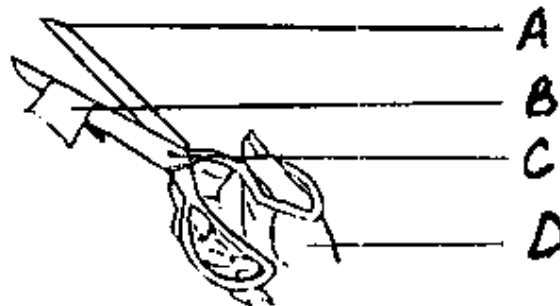
35. Lunga has a running nose, feels hot, and keeps coughing and sneezing. Probably she has

- A. dysentery
- B. AIDS
- C. a common cold
- D. diarrhoea

36. A chameleon survives better on land. What adaptations does it have to survive? It

- A. can be easily seen
- B. changes its colour to that similar to the place where it is.
- C. can move very fast to run away from its enemies.
- D. feeds on fruits.

37. This is an example of a simple machine. Find its fulcrum.



38. To keep fit one has to

- A. read a lot
- B. do some exercises
- C. eat and sleep
- D. consult a witch doctor.

39. Which one of the following factors is most needed by germinating seeds?

- A. Water
- B. Warmth
- C. Soil
- D. Light

40. If Nomsa has AIDS we should

- A. not play with her
- B. be afraid of her
- C. treat her like one of us
- D. not shake hands with her

SWAZILAND MINISTRY OF EDUCATION

SWAZILAND PRIMARY CERTIFICATE EXAMINATION FOR PRIMARY SCHOOLS, 1993

SCIENCE - PAPER II

WEDNESDAY, NOVEMBER 24th - 08:30 a.m. - 10:30 a.m.

TIME:	2 HOURS	TOTAL MARKS:	60
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CENTRE NUMBER:	
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CANDIDATE'S NUMBER	
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INSTRUCTIONS:

1. Answer all questions.
2. Write answers in the spaces provided
3. Use ink or ball point pen

QUESTION 2

(a) Name three types of rocks.

_____ (3)

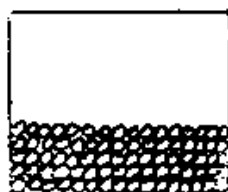
(b) Which type of rock is common in Swaziland?

_____ (1)

(c) Give two uses of water

_____ (2)

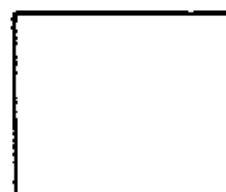
(d) i In the boxes provided draw the particles that show water in a liquid and gaseous state. The solid state has been done for you.



Solid



Liquid



Gas

(2)

ii Give two conditions necessary for evaporation to take place.

_____ (2)

(10)

C. Fill in the right word that describes the type of cloud from this list: cumulus, nimbus and cirrus.

DESCRIPTION OF CLOUDS	TYPE OF CLOUD
i Featherly, fibre-like	
ii Dark layers may contain rain	
iii Heaps separated by blue sky	

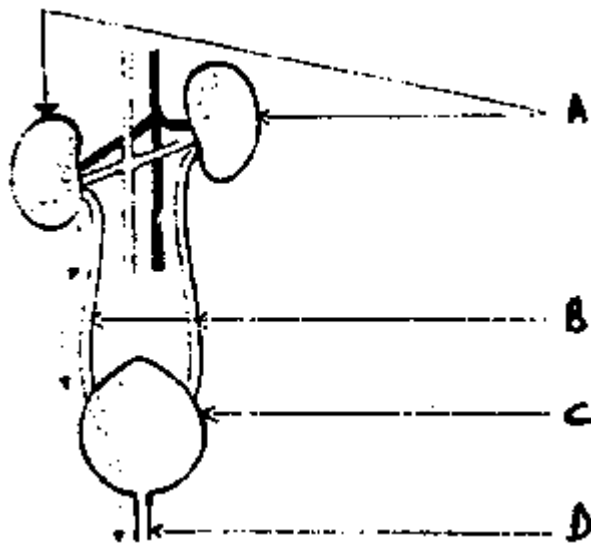
(3)

D. What do you call plants and animals that have decayed and added to the soil to make it fertile? _____ (1)

(10)

QUESTION 4

(a) Study this diagram of the urinary system and label parts A, B, C and D.



(4)

(b) What is excretion?

_____ (3)

(c) Name any two natural resources.

_____ (2)

(d) What is excreted by the lungs?

_____ (1)

(10)

QUESTION 6

a) Name two types of roots.

_____ (2)

(b) State two main functions of roots.

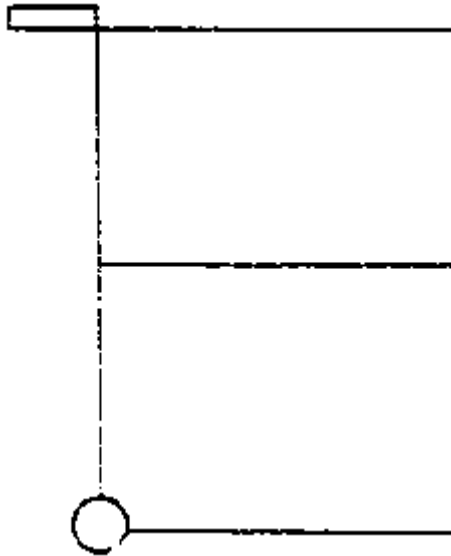
_____ (2)

(c) A fully developed ovary is called a _____ (1)

(d) Name two processes that take place in a leaf.

_____ (2)

(e) Label these parts of a pendulum.



(3)

(10)

3.7.5. Swaziland Primary Certificate Examination 1994 - Agriculture Paper

MINISTRY OF EDUCATION
SWAZILAND PRIMARY CERTIFICATE
FINAL EXAMINATION 1994

AGRICULTURE

FRIDAY, NOVEMBER 18th - 11:00 a.m. - 12:30 p.m.

TIME:	1 HOUR 30 MINUTES	TOTAL MARKS:	100
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CANDIDATE'S NUMBER:	
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SCORE:	
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SECTION I

Marks (30)

TEST INSTRUCTIONS FOR STUDENTS:

1. Read all questions carefully before you answer.
2. Five possible answers are given for each question, **ONLY ONE** is correct.
3. Choose the best answer and put a cross (x) over the letter on the **SEPARATE** answer sheet provided.

EXAMPLE:

How many legs does a chicken have?

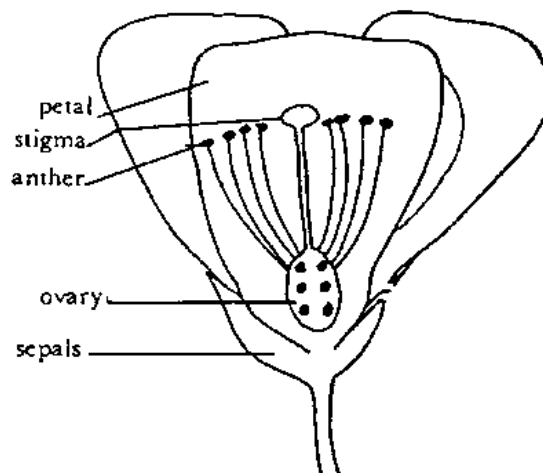
- A. Four
- B. Two
- C. Thirty Two
- D. Ten
- E. Eight

SECTION I

1. Look carefully at the flower below. Then answer the question that follow.

Where do seeds develop?

- A. Ovary
- B. Petal
- C. Anther
- D. Sepal
- E. Stigma



2. Where do cutworms damage a seedling?
 - A. At leaf level
 - B. At shoot level
 - C. At root level
 - D. Below the soil surface
 - E. At the soil surface

3. Which soil particles make the best soil structure?
 - A. Silt - Clay - Sand
 - B. Loam - Sand - Water
 - C. Sand - Air - Water
 - D. Air - Clay - Silt

4. What kind of soil is a "heavy soil"?
 - A. One with too much air
 - B. One with a 10kg weight
 - C. One with too much clay
 - D. One with a 100kg weight
 - E. One with too much water

5. Why do plants need water?
 - A. to spread their roots wide
 - B. to make their food
 - C. to die peacefully
 - D. to spread their leaves
 - E. to produce strong stems

6. A soil pH of 5.8 is good for which type of crops?
 - A. all legumes
 - B. all vegetables
 - C. all fruit trees
 - D. all trees
 - E. all grasses

7. Which is the most common problem of soil erosion in Swaziland?
 - A. muddy erosion
 - B. wind erosion
 - C. surface erosion
 - D. silt erosion
 - E. water erosion

8. What is the best way of controlling soil erosion?
 - A. Planting up and down the slope like they do in Malkerns
 - B. Overstocking
 - C. Grass burning
 - D. Cattle tracks
 - E. Keep the soil covered completely.

9. Which company below produces sugar?
 - A. Mpaka Coal Mine
 - B. Shiselweni Forest Company
 - C. Ubombo Ranches
 - D. Usuthu Pulp Company
 - E. Swaziland Fruit Cannery

10. During a sugar-processing process, why is lime mixed with the juice?

- A. to speed up the process
- B. to stop the process
- C. to remove unwanted materials
- D. to make it less acidic
- E. to make it taste better

11. Which climate do citrus trees grow best in?

- A. a very cold climate
- B. a semi-desert climate
- C. a cold climate
- D. a warm climate
- E. a dry climate

12. Look carefully at the picture below. Then answer the questions below it.



Why does the pineapple worker cover her hands, feet and legs?

- A. to protect herself from injury by the spines
- B. to protect herself from injury by the sun
- C. to protect herself from injury by the stem
- D. to protect herself from injury by the pineapple fruit
- E. to protect herself from broken bottles.

13. Spot a produce from cotton seed below.

- A. jelly
- B. grease
- C. tar
- D. oil
- E. paraffin

14. Why are trees planted mostly in the Highveld?

- A. Because it is hot
- B. Because they need a lot of rain
- C. Because it is cold
- D. Because it is usually bright and sunny
- E. Because it is dry

15. Which forest company in Swaziland produces gum mainly for mining?

- A. Tonkwane Estates
- B. Swaziland Plantations
- C. Usuthu Forest
- D. Bhunya
- E. Shiselweni Forest

16. A ripe maize seed has a _____ patch

- A. round
- B. blue
- C. square
- D. red
- E. black

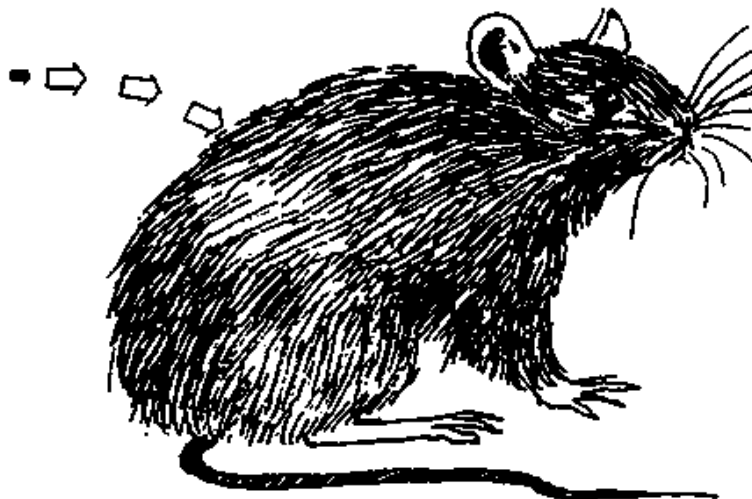
17. When are potatoes harvested?

- A. One to two months after planting
- B. When the tops are dry
- C. When the flowers develop
- D. 6 Months after planting
- E. 3 months after planting

18. Drying crops before storing helps to reduce losses caused by _____

- A. rats and mice
- B. cattle and donkeys
- C. parasites
- D. pests and diseases
- E. man

19. How can you protect your maize crib from



from damaging your maize cobs?

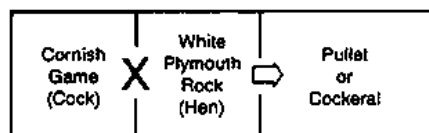
- A. Kill them all
- B. Guard the crops
- C. Use DDT
- D. Use jeyes fluid
- E. Use rat baffles

20. Which, is a disadvantage of keeping chickens in an extensive system?

- A. Low produce
- B. Tasty meat
- C. Healthy chickens
- D. Good looking chickens
- E. Fast growth

21. **Look carefully at the illustration on the right.**

Then answer the question.



Which is the parent stock in the illustration?

- A. pullet and cockerel
- B. Cock, cockerel and hen
- C. White Plymouth hen and Cornish Game Cock
- D. Both hen and cockerel
- E. White Plymouth Rock

22. How can you recognize a chicken with Newcastle disease?

- A. Feathers are rough
- B. Wings become paralysed
- C. The bird starts shivering
- D. Diarrhoea with blood
- E. Legs become paralysed

23. Why is ventilation important in a broiler house?

- A. it helps to keep the birds cool
- B. it provides heat to the chickens
- C. it provides enough water to broilers
- D. it prevents birds from getting water
- E. it stops birds from getting air

24. Which of the following cattle breeds has an African origin?

- A. Brahman
- B. Jersey
- C. Simmentaler
- D. Afrikander
- E. Friesian

25. Which of the following is a milk product?

- A. Orange Marmalade
- B. Quava juice
- C. Margarine
- D. Holsum
- E. Yoghurt

26. Hay is made just _____ the grass flowers.

- A. when
- B. after
- C. on
- D. before
- E. in

27. A large grazing area where cattle put on weight is a _____

- A. paddock
- B. breeding station
- C. kraal
- D. fattening ranch
- E. Bull Exchange Scheme

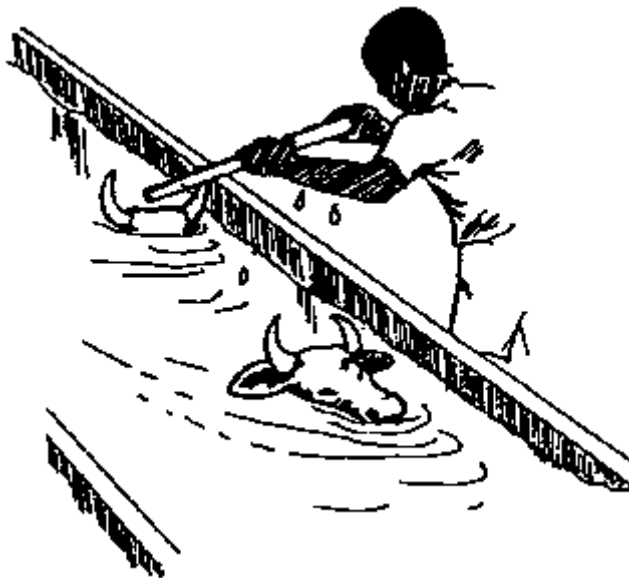
28. Which of the following diseases can be passed on from cattle to humans?

- A. Merek
- B. Blackleg
- C. Contagious abortion
- D. Newcastle
- E. Anthrax

29. A tick is a _____

- A. harmful parasite
- B. germ
- C. helpful insect
- D. virus
- E. internal parasite

30. Cattle are being dipped by this method.



Why are they dipped?

- A. to kill ticks
- B. to make them as fat as possible
- C. to remove their fur (hair)
- D. to make them look nice
- E. to feed ticks

SECTION II

Read all the questions carefully before you begin. Answer all questions on the spaces provided.

QUESTION 1

Use the following words to complete the food chain below. Use arrows where necessary.

Chicken, Man,	Grass, Grashopper,
------------------	-----------------------

--	--	--	--

(7)

QUESTION 2

Match the word / statements to the ones in the blocks on the right. Then **write only the letter** of the correct one on the space provided on the far right.

i) Burnt before harvesting	A. Pumpkinfly	_____
ii) Sunflower	B. Rumevite	_____
iii) Stocklick	C. Sugarcane	_____
iv) Keeps the chicks warm	D. Backs of flower turn yellow and hard	_____
v) Attacks flowers, and fruits fail to set	E. Brooder	_____

(5)

QUESTION 3

The chart below shows how a spinach plant grew from the 1st week of emergence to 12 weeks. The plant was measured once every week. **Study it carefully**, and then answer the questions below.

Week	1	2	3	4	5	6	7	8	9	10	11	12
Height of plant (cm)	5	8	9	10	10	10	15	18	22	30	38	47

a) By how many centimetres did the spinach grow between week 1 and week 10.

b) By how much did it grow between week 4 and week 6?

c) What could be the reason for it maintaining the same height between week 4 and 6?

_____ (6)

QUESTION 4

Fill in the missing words in the passage below. The words are provided for you above the passage.

Kill; Lime; Prepare; Air; Fork; Compost; Spade; Roots; Dig

To cultivate the land means to _____ it for planting.

We _____ the soil to _____ weeds; to mix _____, and _____ with it, to put _____ back into the soil, and make it easier for plant _____ to spread. Tools used to cultivate the soil are _____, hoe, _____ and rake.

(9)

QUESTION 5

What is another name for the grass "Eragrostis Curvula"?

_____ (2)

QUESTION 6

Complete the crop rotation for year 4 below.

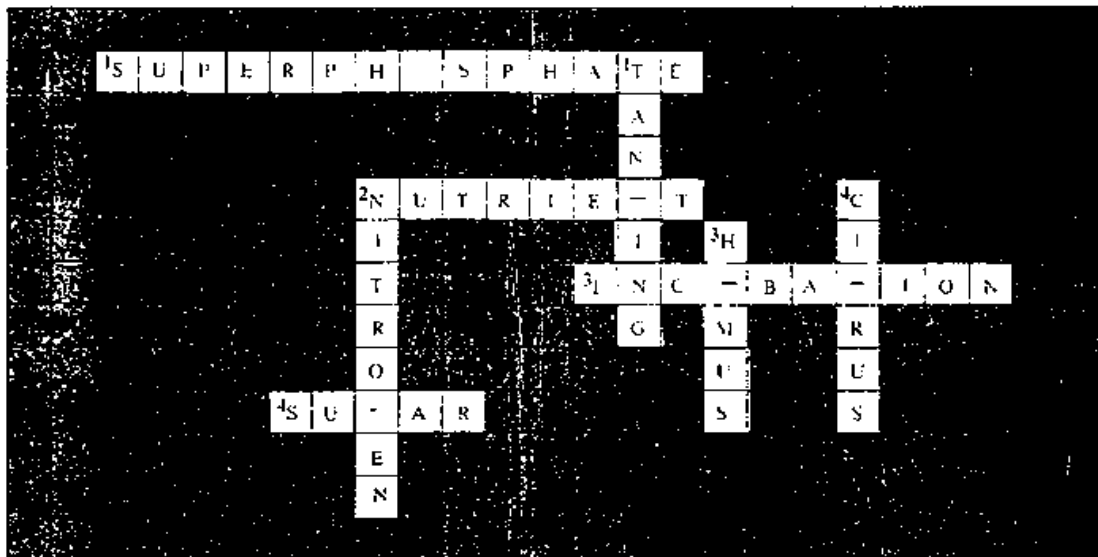
Plot	Year 1	Year 2	Year 3	Year 4
A	Grass	Beans	Maize	
B	Potatoes	Grass	Beans	
C	Maize	Potatoes	Grass	
D	Beans	Maize	Potatoes	

(4)

QUESTION 7: CROSS WORD PUZZLE

Use the statement that is meant by the phrase to solve the puzzle. Fill in the correct **letter** in the blank to complete the word.

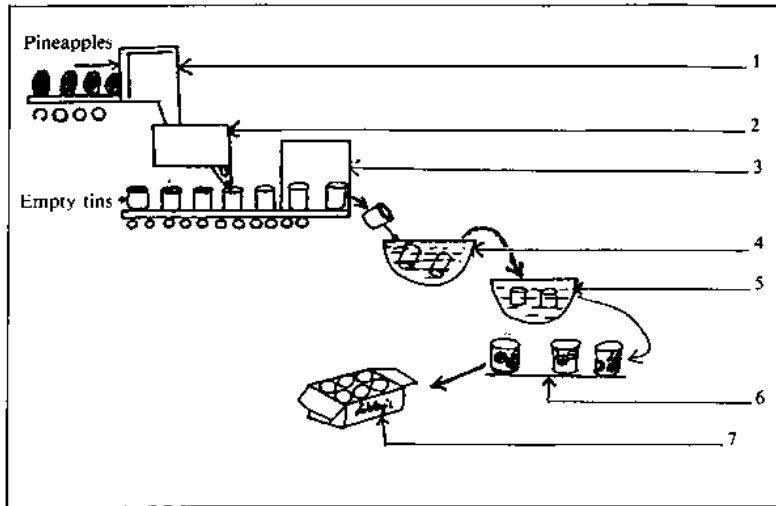
ACROSS	DOWN
1. A good fertilizer for tomatoes.	1. Treating skins for leather.
2. Potassium is an example of a major _____.	2. Increases leaf growth.
3. Hen sitting on eggs to warm them.	3. _____ is decayed plant and animal materials.
4. Export brings in the most money into Swaziland.	4. Oranges and Naartjies.



(9)

QUESTION 8

Look carefully at the illustration of a pineapple processing. Write in the missing stages 1 to 7.



(7)

QUESTION 9

This Prevocational Agriculture student from St. Phillips High School sold produce from his crop project at home

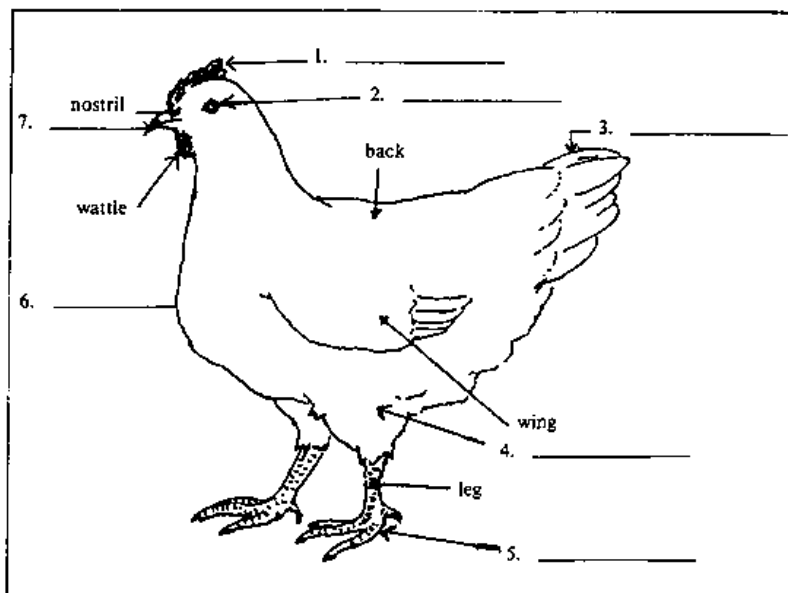
- 4 bales cotton sold for E202,00 per bale
- 3 bags sorghum for E40,00 per bag
- 2 Magogogo beans for E60,00 each

Item	E	c
TOTAL		
If he spend E528,00 buying all his inputs		
i) How much money did he make?		
ii) Which crop was sold for the lowest price per unit?		
iii) How much profit / loss did he make?		

(10)

QUESTION 10

On the picture of a chicken below label the parts marked 1 to 7



(7)

QUESTION 11

What did you do to keep the litter dry in your broiler house?

(2)

QUESTION 12

Why are Swaziland's cattle not very good for meat?

(2)

SECTION I

ANSWER SHEET (AGRICULTURE)

INSTRUCTIONS: DETACH ANSWER SHEET BEFORE ANSWERING

CANDIDATE'S NUMBER:	
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EXAMPLE BELOW:

0	A	B	C	D	E
---	---	--------------	---	---	---

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E
21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E
28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E

3.7.6. Swaziland Primary Certificate Examination 1993 - Agriculture Paper

MINISTRY OF EDUCATION
SWAZILAND PRIMARY CERTIFICATE
FINAL EXAMINATION 1993

AGRICULTURE

WEDNESDAY, NOVEMBER 24th - 11:00 a.m. - 12:30 p.m.

TIME:	1 HOUR 30 MINUTES	TOTAL MARKS:	100
--------------	--------------------------	---------------------	------------

CANDIDATE'S NUMBER:	
----------------------------	--

SCORE:	
---------------	--

SECTION I

TEST INSTRUCTIONS FOR STUDENTS:

1. Read all questions carefully before you answer.
2. Five possible answers are given for each question, **ONLY ONE** is correct.
3. Choose the best answer, then make a "cross **X**" on the correct letter on the answer sheet. The cross must fill the whole square.

EXAMPLE:

How many legs does a chicken have?

- A. Four
- B. Two
- C. Thirty Two
- D. Ten
- E. Eight - (See answer sheet for your answer)

SECTION I

1. When you eat an onion bulb, what part of a plant do you eat?

- A. fruit
- B. stem
- C. leaf
- D. root
- E. flower

2. Witchweed is an example of a _____

- A. pest
- B. poisonous plant
- C. parasite
- D. poison
- E. helpful plant

3. Look carefully at the picture. What is the right food chain for it?



- A. Black eagle ⇒ plant ⇒ worm ⇒ lizard ⇒ hyena
 - B. Plant ⇒ lizard ⇒ worm ⇒ hyena ⇒ black eagle
 - C. Hyena ⇒ black eagle ⇒ worm ⇒ lizard ⇒ plant
 - D. Lizard ⇒ hyena ⇒ black eagle ⇒ plant ⇒ worm
 - E. Plant ⇒ worm ⇒ lizard ⇒ black eagle ⇒ hyena
4. A wet soil is damaged when you
- A. stand on it
 - B. dig it
 - C. clean the area
 - D. prepare planting lines
 - E. make a seedbed
5. Breaking the soil clods down to the small pieces is the same as preparing _____
- A. a fine tilth
 - B. raking
 - C. digging it
 - D. topdressing
 - E. capping
6. If you grew beetroot at home, what was the space between the plants in a row?
- A. 30cm
 - B. 10cm
 - C. 15cm
 - D. 5cm
 - E. 20cm

7. How deep should spinach seeds be planted?

- A. 3.5cm
- B. 1.2cm
- C. 1.5cm
- D. 2.5cm
- E. 0.5cm

8. Which one is a function of a handfork?

- A. harrowing
- B. removing weeds
- C. thinning
- D. marking straight lines
- E. digging

9. To prevent this disease in tomatoes, we used a dithane- copper oxychloride mixture. Which one is it?

- A. rust
- B. late blight
- C. downey mildew
- D. black rot
- E. streak

10. How much dipterex 95% WP do you use to spray cabbages with 5 litres of water? (MB = matchbox)

- A. 4MB
- B. 3MB
- C. 5MB
- D. 2½MB
- E. 3½MB

11. In clay soil, pore space is _____

- A. thin
- B. flat
- C. large
- D. good
- E. small

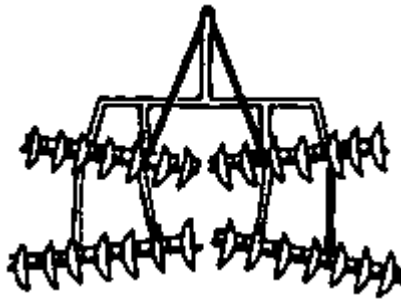
12. What does humus add to a soil?

- A. water
- B. air
- C. soil pests
- D. nutrients
- E. poisons

13. Which of the following damages plant cover if it is done wrong?

- A. mulching
- B. grass burning
- C. rotation of crops
- D. cattle tracks
- E. soil erosion

14. Look carefully at the picture of a tool. What is the use of the tool?



- A. breaking down soil lumps
- B. ploughing
- C. marking straight rows
- D. planting
- E. weeding

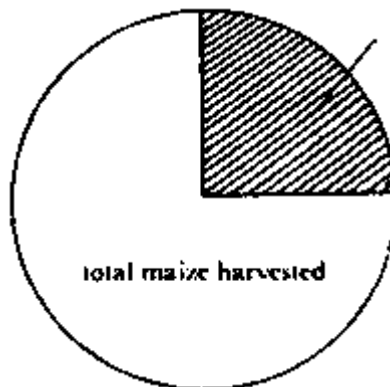
15. From which part of a plant do new potato tubers grow?

- A. root
- B. leaves
- C. stem
- D. flower
- E. fruit

16. How long should sweetpotato cuttings be at planting?

- A. 25cm
- B. 40cm
- C. 30cm
- D. 20cm
- E. 65cm

17. Look carefully at the diagram and answer the question. How much losses of crops due to poor storage in Swaziland?



- A. 33%
- B. 50%
- C. 25%
- D. 20%
- E. 10%

18. When beans inside a pod are hard. What should be done to avoid damage to them?

- A. thin them
- B. stake them
- C. water them
- D. harvest them
- E. dry them

19. If the nuts inside a pod rattle then they _____

- A. are still very wet
- B. are just wet
- C. are dry
- D. are broken
- E. are rotten

20. Which of the following is **not** a sign of harvesting sunflower?

- A. when the tops have died
- B. when the plant is dry
- C. when seeds begin to fall down
- D. when the back of the flower turns yellow
- E. when the flower is yellow and hard

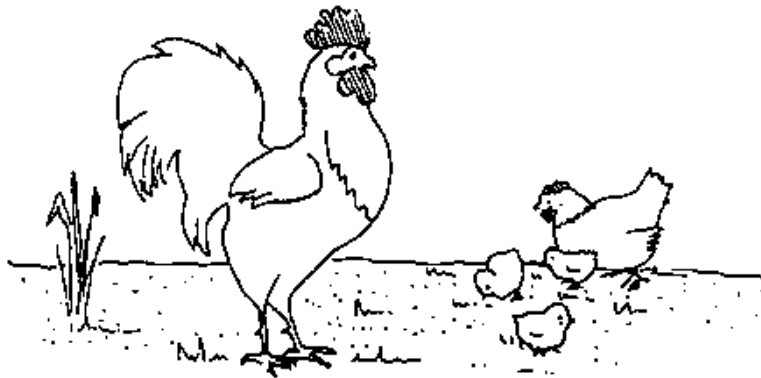
21. A sixth grade student at Nokwane Primary School obtained profit from the following crops last year.

- E620,00 from 2 ha of pumpkin
- E260,00 from 2 ha of groundnuts
- E480,00 from 4 ha of dry beans
- E1 500,00 from 2 ha of sugarcane

Which of the crops gave her the least profit per hectare?

- A. sugarcane
- B. groundnuts
- C. pumpkins
- D. dry beans
- E. groundnuts and sugarcane

22. The picture below shows one way of keeping chickens. Name it.



- A. deep litter
- B. extensive
- C. battery cages
- D. semi - intensive
- E. Intensive

23. Which of the following should **not** be used to prevent birds from pecking each other?

- A. sump oil
- B. tar
- C. Jeyes fluid
- D. Malathion
- E. ash in oil

24. Broiler finishers is recommended for birds from:
- A. One day to 4 weeks
 - B. 15 to 21 weeks
 - C. 6 to 4 weeks
 - D. 9 to 12 weeks
 - E. 4 to 10 weeks
25. How much feed per week would a chicken of 650gm (weight) need?
- A. 490gm
 - B. 330gm
 - C. 560gm
 - D. 770gm
 - E. 210gm
26. What do we mean by "cattle industry"?
- A. feast on meat
 - B. hooves
 - C. a cattle business
 - D. dairy animals
 - E. Brahman cattle
27. Overstocking of cattle causes
- A. underweight animals
 - B. good milkers
 - C. long horns
 - D. fat animals
 - E. good draughters
28. During silage making, a plastic sheeting is placed over it. What is the main reason for this?
- A. to avoid heat build up
 - B. to avoid rain and air
 - C. to avoid cold temperatures
 - D. to avoid oxygen build-up
 - E. to avoid carbon build-up
29. Where are cattle fattened?
- A. abattoir
 - B. dipping tank
 - C. paddock
 - D. kraal
 - E. fattening ranch
30. Which is a symptom of black leg disease in cattle?
- A. short shoulders
 - B. black shoulders
 - C. black legs
 - D. swollen shoulders
 - E. fat legs

SECTION II

70 MARKS

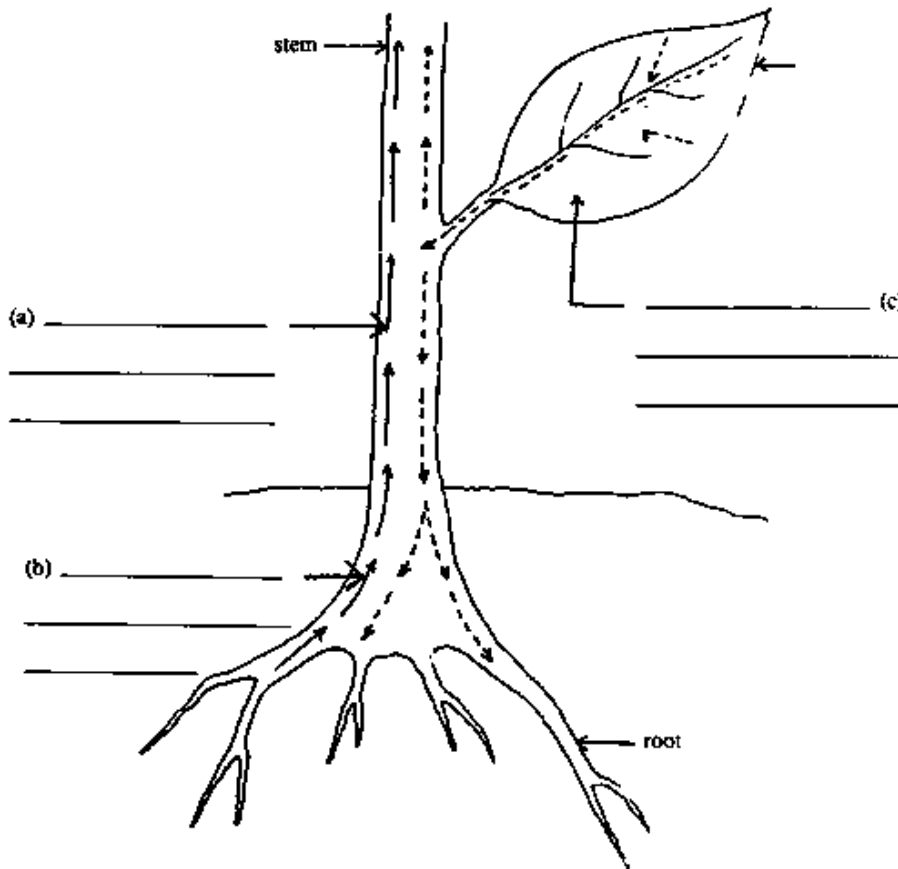
Read all the questions carefully before you begin Answer all questions on the spaces provided

QUESTION 1

Look carefully at the picture. What is happening at the parts marked (a), (b) and (c)?

(2 marks each)

(6)

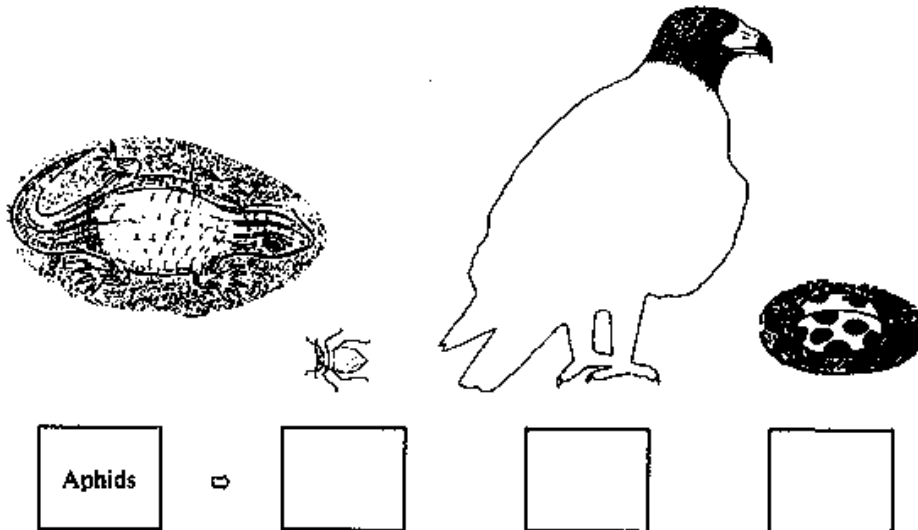


QUESTION 2

a) What is a food chain? _____

_____ (2)

b) Look at the mixed pictures carefully. Then complete the food chain below. Use names and arrows. The first one has been done for you.



(10)

QUESTION 3

You used a set of tools for your practicals in the garden at school. Tell us, what did you use these tools for?

- i) Trowel _____ (2)
- ii) garden fork _____ (1)
- iii) wheelbarrow _____ (1)
- iv) slasher _____ (1)
- v) handfork _____ (2)
- vi) bushknife _____ (1)

(8)

QUESTION 4

Match the statement or word **to the correct** word or statement on the right. **Then write only the letter of the correct answer** on the space provided **on the far right**.

1. Diarrhoea with blood	A. special house	_____
2. Friesian	B. Oranges & Grapefruit	_____
3. Bags on raised floor	C. Stick can be bent more than halfway	_____
4. Orchard	D. Not resistant to ticks	_____
5. Clay loam	E. Coccidiosis	_____

(5)

QUESTION 5

"A school girl dies after drinking pesticide"

a). Why did the girl die here? _____ (2)

b) Name 3 ways by which pesticides enter a human body.

- i) _____
- ii) _____
- iii) _____ (3)

c) If you sprayed against the wind, and the chemical went straight into your eyes. What would happen to you? _____

_____ (2)

d) What 2 things should one use to clean a chemical that came into contact with the body?

i) _____

ii) _____ (2)

(9)

QUESTION 6

Look at the maize leaf picture carefully. Then answer the questions.



a) What caused those holes? _____

_____ (1)

b) Was it a sucking or biting animal? _____

_____ (1)

c) What chemical did you use to kill the pest? _____

_____ (1)

(3)

QUESTION 7

On the chart provided write:

a) The number of days each crop takes from planting to harvest.

b) The month for harvesting each crop. Planting dates have been provided for you. Then answer the questions below the chart.

Name of crop	Date on which crop was planted	Number of Days to harvest	Harvesting month
Maize	1st September	i) _____	v) _____ (1)
Sweetpotato	5th October	ii) _____	vi) _____ (1)
Groundnuts	15th October	iii) _____	vii) _____ (1)
Cotton	20th October	iv) _____	viii) _____ (1)

c) Which one is quickest to mature? _____ (1)

d) Which crop takes the longest to mature? _____ (1)

(10)

QUESTION 8

Give 3 ways of protecting crops in storage

- i _____
- ii _____
- iii _____

(3)

QUESTION 9

On the space provided, write down the:

a) advantages and disadvantages of keeping **day old chicks**

a) Day old chicks

Advantages	Disadvantages (3)
i	
ii)	
iii	

b) Write down advantages and disadvantages of keeping **4 weeks old chicks**

b) 4 Weeks old chicks

Advantages	Disadvantages (3)
i)	
ii)	
iii)	

(6)

QUESTION 10

Study carefully the chart for chickens where a wrong method of feeding was used.

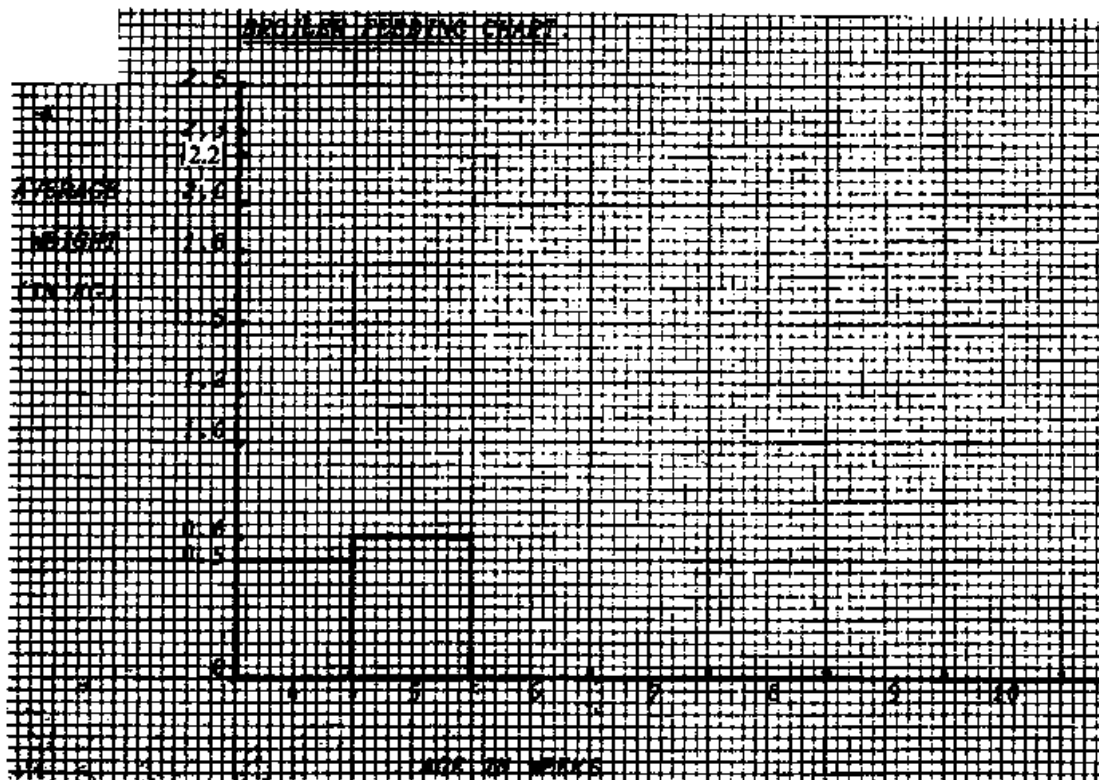
Results of feeding broilers using the wrong method of feeding:

Age in weeks: From 4 weeks of age	Average weight of each bird in kg
4	0.5kg
5	0.6kg
6	0.5kg
7	0.6kg
8	1.0kg
9	1.8kg
10	2.2kg

a) Plot neatly these figures on the axis provided showing the growth rate.

The first two have been done for you.

BROILER FEEDING CHART:



b) Give one essential or important element **not** properly given to the birds at the beginning of week 6 _____ (9)

QUESTION 11

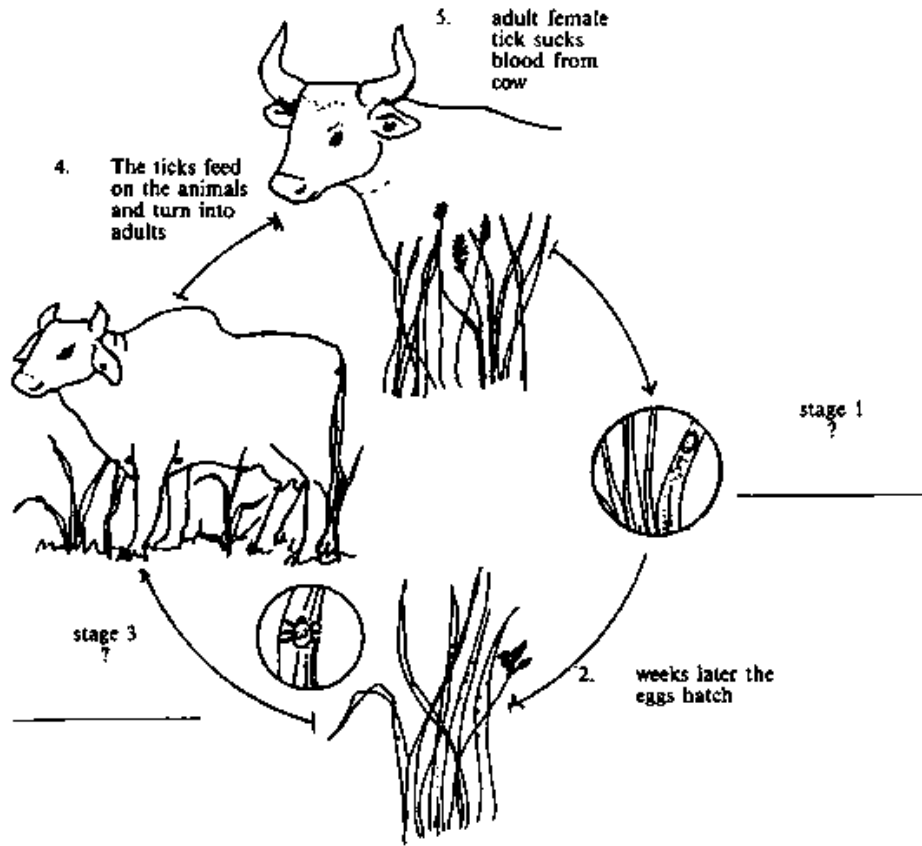
Mrs Sifundza (near Shemula Primary School) sold 320 broilers at 10 weeks, for E12,00 each.

	E	c
a) How much money did she get for them? Show how you get your answer.	Returns	
b) If she spent E1 500,00 on raising the birds. Did she make a profit or loss?	Costs	
c) How much is it?	Profit / Loss	

(6)

QUESTION 12

Complete the life cycle of a tick by writing out a full sentence for stages 1 and 3 below.



Stage 1: _____
_____ (2)

Stage 3: _____
_____ (2)

(4)

SECTION I

ANSWER SHEET (AGRICULTURE)

INSTRUCTIONS: DETACH ANSWER SHEET BEFORE ANSWERING

CANDIDATE'S NUMBER:	
---------------------	--

EXAMPLE BELOW:

0	A	B	C	D	E
---	---	--------------	---	---	---

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E
21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E
28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E

3.8. Tanzania

3.8.1. Overview

End of Primary School Examination

1. **Title of examination:** Primary School Leaving Examination (PSLE)
2. **Amount of fees charged:** Nil
3. **Examination after years in primary school (6, 7, 8 years):** 7 yrs
4. **Children's entry age in primary school:** 7 yrs
5. **Number of pupils sitting examination in 1994:** 384,762
6. **Examination subjects offered:** 9 subjects are offered in 3 papers:
 - Language (Kiswahili, English)
 - Mathematics
 - General Knowledge (Civics, History, Geography, Science, Agriculture, Health and Home Science)
7. **Language of examination:** Kiswahili
8. **Institution setting the examination questions:** The National Examinations Council of Tanzania (NECTA)
9. **Have there been any reforms in the examination questions?** Yes
 - When? (year)** 1974-1980, 1981-1982, 1983-1994
 - What kind?**

1974-1980: PSLE consisted of a set of four question papers. These were:

 - English Language
 - Kiswahili
 - Mathematics
 - General Knowledge (Political Education, History, Science, Geography, Agriculture, Health and Home Science)

1981-1982: Number of Examination papers increased from four to five:

 - English Language
 - Kiswahili
 - Mathematics
 - Science (Natural Science, Agriculture, Health and Home Science)

- General Knowledge (Political Education, History, Geography)

During this period (1981-1982) true-false, matching, short-answer (e.g. filling in the blanks) questions were omitted. Excepting Mathematics all papers had multiple-choice type of questions.

1983-1994: PSLE papers reduced to three only: Languages, Mathematics and General Knowledge. With the introduction of a multiparty system in the country's political arena, Political Education has been discarded in favour of Civics. Again, excepting Mathematics, the other papers consist of multiple-choice questions only.

10. **Stages of development of examination questions (please describe):**

- **Setting:** Individually done by subject specialists.
- **Moderation:** Done by a panel of subject specialists. During this stage items are discussed, amended and compiled into several whole equivalent papers.
- **Editing:** Done by a panel of subject specialists other than those who moderated the papers. Here the Head of the Examination Design and Development Department becomes the Chairperson of the editing panel.

Note: All these stages are carried out within NECTA and by NECTA staff/examination officers.

11. **Type of examination questions and distribution of different kind of questions.**

- **Language:** All multiple-choice type of questions. 50 items distributed as follows: Kiswahili 25 items, English 25 items.
- **General Knowledge:** All multiple-choice type of questions. 50 items distributed as follows: Civics 10, History 10, Science 15 and Geography 15. Considering Science only:
30% recall
20% comprehension
30% application
20% higher order
- **Mathematics:** 50 questions. Candidates were expected to work out the solutions and write the answers on separate sheets of paper. Marks are awarded only to final correct responses. No multiple-choice questions.

12. **Is continuous assessment incorporated in the final examination?**

- Yes []
No [x]

13. **Are examination items pretested?**

- Yes []
No [x]

14. **Which professional groups are involved in setting the examination questions?**

Examination officers within NECTA

15. **Are the same professionals who set the examination questions involved in marking papers?** Yes []
No []
Tutors and students of TTCs form the backbone of markers while the setters/ moderators/editors play the supervisory role at the marking centre.
16. **How are examination results used for improving teaching in primary schools?**
- The Regional Education Officers (REOs) carry out evaluation after the selection. The findings are disseminated to school inspectors and teachers who use the information to improve teaching.
 - NECTA carries out item analysis and the results are again disseminated to the relevant educational experts including teachers.
 - Past examination papers are re-edited and printed in booklets by NECTA and sold to teachers, parents, pupils and other interested parties.
17. **To what other uses are the examination results put?** The examination results are mainly used for selection into secondary schools. It may be called Form I Entry Examination.

Note: The Four-Year Teacher Grade B Course whose selection depended on the PSLE results has been scrapped off by the Government.
18. **Main problem with Primary School Leaving Examinations?**
- Administrative, handling/security problems: since the examination results are mainly used for selection and the number of places available in the Government secondary schools are so few and far apart there is a cut-throat competition leading to increasing number of dishonesty cases.
 - Transportation problems: Tanzania is an expansive country in terms of area. Most of her roads are not in good shape thus leading to haulage problems. Lorry break-downs during dissemination of question papers and collection of answer scripts are not uncommon. In addition to transportation problem, printing and marking costs are becoming increasingly overwhelming.

3.8.2. An Overview of the 1993 Primary School Leaving Examination

by Janet P. Kitosi, National Examinations Council of Tanzania, and Ibamba P. Isengwa, Tanzania Institute of Education

The Primary School Leaving Examination in Tanzania is normally taken once a year, on a single day assigned for the purpose. The 1993 examination was taken on the 5th of October, 1993. It tested a total of 9 subjects namely English, Kiswahili, Mathematics, Political Education, History, Science, Agriculture, Home Science and Geography. However, the number of papers offered were only three because most of these subjects were combined to form one paper (Mathematics, General Knowledge, English and Kiswahili). Each of these papers contained 50 items each of which carried one Mark. Hence for the three papers a candidate could score 150 Marks.

All the 50 items of the Language and General Knowledge papers were of multiple-choice type and candidates were required to attempt all the questions in each of these papers in one and a half hours. The Mathematics paper was allocated 2 hours instead of 1 1/2 hours as with the

other two papers. This is because none of the questions in this paper was a multiple-choice type. Hence candidates needed more time to do their calculations in order to get the answers to the items posed.

Except for the English section of the Language paper, all the three papers were set in Kiswahili. There is no separate paper for the science subjects. Questions testing these subjects form a section in the General Knowledge paper. This paper is divided into four sections as follows:

- Section I: Political Education - 7 items
- Section II: History - 8 items
- Section III: Science - 20 items
- Section IV: Geography - 15 items

For the 1993 examination out of the 20 science items, 15 tested Science (including Home Science) and 5 items tested Agricultural Science. For each of the three papers comprising the 1993 PSLE, two equivalent papers were set.¹ These were equivalent in the sense that they were testing the same objectives and content as can be seen in the examples given below:

¹ In 1990 the country was divided into 5 »examination zones« with 5 papers testing e.g. Science. The number of different zones was reduced over the years to two, and since 1994 to only one paper per exam subject for the whole country.

General Knowledge 1		General Knowledge 2	
Q23.	Which of the following sets of characteristics could be used to classify an animal as a reptile?	Q22.	Which of the following sets of characteristics could be used to classify an animal as a mammal?
22.	The lung is one of the excretory organs. Other such organs are:	21.	Sweating is one of the ways by which waste products are removed from the body. Other ways are:
32.	How many °C are equivalent to 158°F ?	31.	How many °F are equivalent to 40°C?

Each of these two papers was sent to half the country, i.e. 10 administrative regions because Tanzania Mainland has 20 of such regions. So the country was divided into two »Examinations Zones«.

The distribution of papers was such that adjacent regions could not get the same paper so that in case of leakage it could be localized rather than have it spread all over the country.

The National Examinations Council (NECTA) was entrusted with the role of setting, moderating, printing, distributing and marking of the 1993 PSLE papers. The Regional Education Officers (REOs) were given the tasks of selecting pupils for further education in secondary schools and also that of carrying out the quantitative and qualitative analysis of candidates' performance in the PSLE for their respective regions.

Latest Developments in Examinations in Tanzania

1. The number of equivalent papers set was reduced from three in 1992 to two in 1993, and finally in 1994 to only one exam for the whole country. This development has a direct bearing to the tremendous decrease in cases of leakages. All along NECTA has been taking deliberate efforts to educate those handling exam papers on the meaning and importance of observing a high degree of confidentiality in all issues pertaining to examinations. Furthermore NECTA is nowadays working very closely with the national security forces and the police right from the time the papers are set until when the exam is taken and marked.

2. For the first time NECTA required candidates' photographs in the 1993 examination for identification purposes. In the past there were cases where relatives or elder brothers and sisters of candidates could sit for the examination on behalf of the actual candidates. This

practice was possible because the person supervising a centre normally comes from a different school and he could not tell whether the candidates appearing for the examination were actually the right ones or not.

3. Again for the first time NECTA instructed the Regional Education Officers (REOs) to establish examination centres in their regions whereby neighbouring schools could take the examination at one centre. This exercise was aimed at reducing the number of centres so that the time spent in distributing and collecting the papers could be reduced.

Problems

- Due to lack of funds and facilities, such as adequate transport, there are no pretests of the examination items.
- The number of dropouts, i.e. candidates who do not show up for the examinations, has been increasing year after year particularly in areas indulged in pastoralism and also due to girls getting pregnant and being sacked from the school before the examination time.
- Repeaters: By law Std. 5-7 pupils are not supposed to repeat classes. But through some tricky means a lot of students repeat Std. 7. However, whenever this is discovered the results in the exam are nullified.

3.8.3. Primary School Leaving Examination (PSLE) in Tanzania Mainland

by Christopher H. Mbiku, National Examinations Council of Tanzania, and Deogratias L.S. Mgema, Tanzania Institute of Education

Historical Background

Primary School Leaving Examinations (PSLE) have been in existence in Tanzania Mainland since 1967. Before 1967 there used to be the General Entrance Examination (GEE) which marked the completion of primary school education and also served as an entrance or selection examination into secondary schools. The GEE was set and administered centrally by the Examination Section in the then Directorate of Curriculum Development and Examinations at the Ministry of National Education Headquarters.

In 1971 the National Examinations Council of Tanzania (NECTA) was established. In 1974 the National Examinations Council started setting and administering the PSLE.

In 1976 the administration of the PSLE changed. It was decided that the preparation of the PSLE questions or items should remain under the central management and control of the National Examinations Council of Tanzania, and that the reproduction (or printing), distribution/administration, marking and other related activities be done by each region under the direction and control of the Regional Education Officers.

Nature and Purpose of the PSLE

From 1974 until 1980, the PSLE consisted of a set of four papers which required an average total of 5 1/2 hours. The examination was normally taken once a year on a single day assigned for the purpose. Beginning in 1981, the number of papers increased from four to five with each paper lasting one hour. These papers were Kiswahili, English, Maarifa (General Knowledge), Hisabati (Mathematics) and Sayansi (Science).

From 1971 until 1980, the type of questions (e.g. multiple-choice, true-false, essay, matching), the number of questions as well as the timing allowed for each paper varied. The fifth paper (Sayansi), introduced in the 1981 PSLE, used to be Section IV of the General Knowledge papers administered between 1971 and 1980. Beginning in 1981 the variations in the type of questions were limited. Except for the Mathematics papers, all the other papers contained mostly objective questions of multiple-choice type.

The PSLE is an achievement examination administered to serve a variety of purposes as defined for basic primary education in Tanzania Mainland.

Assumptions on the Development of PSLE

The setting of the draft papers was done by tutors in the teachers' colleges. Before the final drafts of the Primary Leaving Examination papers were submitted to the Regional Education Officers for further processing, they had to be moderated by subject specialists. The moderators took all necessary measures to ensure that the papers were well-balanced in terms of content coverage, objective and equally fair to candidates at Standard Seven (Std. VII) level for all parts of Tanzania Mainland. It is at this stage where the National Examinations Council experts ascertain the acceptability of the standard required and usability of the PSLE to test pupils with varying differences in academic competence. This aspect, however, is done without regard to geographical location of the schools. The type of PSLE items in current use consist largely of multiple-choice questions.

Test and measurement specialists recommend that trial testing (pretesting) be accorded a special phase in test construction. The merits of pretesting rest entirely upon the likelihood that it will help assemble a test with good quality questions in terms of their psychometric properties. Usually, this process of pretesting allows the **difficulty** of each question to be determined. It also helps to reveal the ability of each question to **discriminate** between strong and weak pupils. Apart from these virtues, pretesting also helps to cast light on the strengths and weaknesses of items and thereby suggests needed improvements in the development and administration of the entire examination.

Although about 70% of the PSLE questions are of the objective type, the National Examinations Council of Tanzania does not undertake pretesting activities owing to economic constraints. Suffice it to say here that NECTA is very much aware of the fact that pretesting, if well conducted, can increase the validity and reliability of an examination.

In order to determine the need for pretesting, at the PSLE level of operations, the Department of Research and Evaluation of NECTA developed a project aiming at carrying out item analysis on the 1981 PSLE papers. This project was developed on the assumption that the findings of these studies would provide a valuable picture of the kind and extent of reliance NECTA could put on the use of objective tests in national testing programmes. Specifically stated, the objectives of the project were:

- to identify items suitable for item banking;
- to carry out training programmes on test construction and other related techniques;
- to lay a firm basis for objective testing at the Primary School level.

The results of the research are contained in a book published by the Department of Research and Evaluation in March, 1983.

PSLE for the Period 1983 - 1992

In 1983, the National Examinations Council of Tanzania was once again entrusted with the roles of setting and moderating PSLE papers, reproduction (printing), distribution of the question papers up to regional headquarters and marking. The Regional Education Officers were given the following tasks in respect of PSLE:

- to distribute the question papers (already in envelopes sealed by NECTA) to examination centres/schools;
- to collect the answer-scripts from the centres and forward them to the marking centre;
- to collect the original consolidated mark sheets and the scripts after the marking exercise;

- to supervise the selection exercise;
- to carry out a quantitative and qualitative evaluation of PSLE performance of candidates.

Due to the large number of pupils (about 300,000) taking the PSLE, the examination papers have been restructured. Several major changes have been effected in the construction and administration of the PSLE.

First, the number of examination papers has been reduced from five to three: namely Lugha (Languages), Hisabati (Mathematics) and Maarifa (General Knowledge). In Lugha, Kiswahili and English are examined. This paper consists of fifty multiple-choice questions. Candidates are required to attempt all the questions in one hour and thirty minutes. In Hisabati, candidates are examined in elementary arithmetic, cartesian geometry, algebra, commercial arithmetic, statistics and coordinate geometry. This paper consists of fifty questions and candidates are required to attempt all the questions in one hour and forty-five minutes. Although the method used to arrive at answers is not required, candidates are given a working space in the question paper and answers are written on a separate sheet of paper designed for this purpose. In Maarifa, four subjects are examined.¹ These are: Political Education - 10 items, History - 10 items, Science -15 items and Geography - 15 items. All the items in this paper are multiple-choice type.

¹ Since 1993 the General Knowledge Paper consists of questions from six subjects. See also »3.8.2. An Overview of the 1993 Primary School Leaving Examination«.

For the purpose of selection of pupils to join the Government Secondary Schools, each question or item carries an equal weight so that a maximum of 150 points may be scored for all the three papers.

The second aspect of the PSLE lies in the preparation of the questions themselves. In the past, questions were set by various tutors teaching in the teacher training colleges and then moderated by the subject specialists in the National Examinations Council of Tanzania. Nowadays, the questions are set by subject specialists within NECTA and moderated by a panel of subject specialists again within NECTA. This means that the quality of the examination questions on the one hand and the security of PSLE papers on the other hand have been enhanced.

In the past, as stated above, NECTA used to set and moderate five papers for each region. These papers were different in the sense that they had different answers but were equivalent in weight and content. At present, the situation is different. NECTA has divided Tanzania Mainland into »examination zones«. These zones are not permanent. They vary in place and time. If, for example, Kilimanjaro Region belongs to zone one this year, next year it may be in zone three. In the period 1983 - 1990 there were five examination zones. Tanzania Mainland has 20 regions which means that each examination zone consisted of four scattered regions. The advantages of administering PSLE in zones lie in the security of the examination papers, in that the temptation to steal the papers or cram some of the contents therein is discouraged by the wide choice one has to make. The disadvantage of this system lies in the cost: for five zones alone one needs to set and moderate fifteen different but equivalent papers. An equivalent number of films and plates are used during printing. It is for this reason that the number of examination zones has been reduced to four and three in the years 1991 and 1992, and finally to one nationwide zone since 1994.

In order to strengthen the security of the Primary School Leaving Examination further, the National Examination Council of Tanzania has decided to work jointly with the other state organs, i.e. the National Security Force and the police. These are fully involved during the printing stage, transportation from NECTA headquarters to the regions and the marking exercise.

Finally, there comes the aspect of motivation. Apart from educating those who handle the examination papers on the meaning and importance of security, an incentive package is necessary if one is to achieve the desired goals. NECTA realized the immense value of

motivation and started to implement this in 1983. It is for this reason, in conjunction with those stated above, that PSLE leakage is now history. But this does not imply that PSLE is devoid of irregularities. However, a stage has been reached where one may sigh with relief.

Marking of PSLE Scripts

One of the most important stages in the administration of examinations is the marking of candidates' scripts. The reduction of the number of PSLE question papers means that emphasis in the examination has shifted from summation to selection. To ensure fair selection, correct data must be obtained and processed accurately. The processing speed must be high enough to warrant timely delivery of the information to the decision makers (e.g. selectors). Both the data and information generated need to be stored in a form appropriate for easy retrieval.

It was in view of these demands that the National Examinations Council of Tanzania, with the aid of an IDA loan, bought a computer complex in 1985. But to acquire a computer unit is one thing and to be able to use it effectively is another. It was planned that PSLE scripts would be marked by a computer using optical mark readers and that thereafter all the data would be processed by the computer. To achieve this one requires trained personnel to handle the computer software and hardware. To date NECTA has not started marking PSLE scripts by computer for lack of sufficient manpower resources both in the schools and at NECTA headquarters. However, the Department of Research and Evaluation on its own initiative has embarked on keying the massive data for the purpose of storing and obtaining valuable statistical parameters.

At present, the marking and processing is done manually. However, precautionary measures are taken during marking to ensure that maximum reliability of the data obtained is achieved. This is accomplished mainly by using checkers at every stage of the entire marking process which includes marking, counting of marks, entering of marks in consolidated mark sheets, addition of marks and filing of consolidated mark sheets. The main consumers of PSLE data are the Regional Education Officers (REOs) and the Ministry of Education and Culture. To avoid irregularities during selection, NECTA keeps the carbon copy of all the PSLE raw marks recorded in the consolidated mark sheets (CMS). The original CMS and the scripts are returned to REOs who, after completing the selection exercise (based on the quarter system), carry out an evaluative analysis of performance of their candidates in their respective regions. These evaluative reports are used to guide or counsel the teachers in the field so that they may improve their teaching and thereby candidates' performance.

Concluding Remarks

Hundreds of thousands of pupils complete primary education annually. It is disturbing to note that only six percent (6%) are selected to join public or government secondary schools. No doubt, an examiner always faces difficult choices. Should the examiner set questions to cater for the upper group only? Should he/she consider the majority only? Or should he/she strike a balance by including items for both groups?

3.8.4 Primary School Leaving Examination 1994 - General Knowledge Paper (Section IV: Science), (English Translation)

THE UNITED REPUBLIC OF TANZANIA

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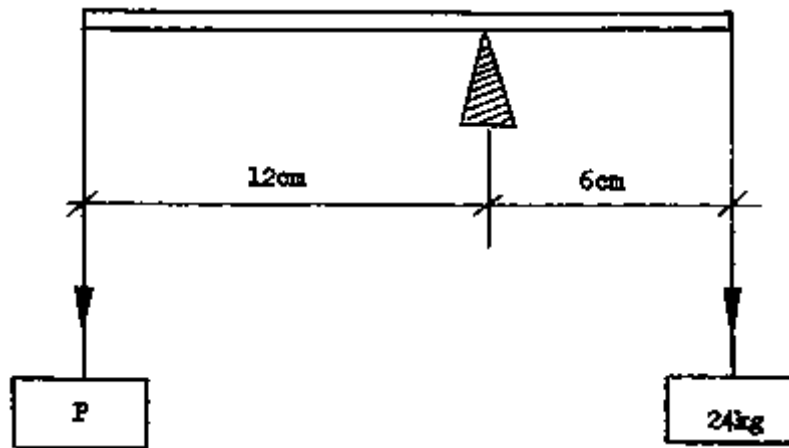
PRIMARY SCHOOL LEAVING EXAMINATION 1994

GENERAL KNOWLEDGE

Section IV: SCIENCE (Choose the letter of the correct answer)

31. Blood flowing out of the heart to other parts of the body normally has
- A. a lot of humidity
 - B. a lot of oxygen
 - C. no carbon dioxide
 - D. little oxygen
 - E. a lot of carbon dioxide
32. The earth's rotation around its own axis brings about
- A. seasons of the year
 - B. eclipse of the sun
 - C. day and night
 - D. eclipse of the moon
 - E. high and low sea tides
33. An animal has lungs just like a fish has
- A. gills
 - B. fins
 - C. scales
 - D. skin
 - E. mouth
34. Excretion is one of the characteristics of living things. Other characteristics are:
- A. Hearing and seeing
 - B. Hearing and responding to stimuli
 - C. Respiring and growing
 - D. Eating and speaking
 - E. seeing and responding to stimuli
35. The type of food that is synthesized in the green parts of plants is
- A. protein
 - B. carbohydrates
 - C. vitamins
 - D. fats
 - E. salts
36. One of the properties of loam soil is
- A. inability to allow water to pass through
 - B. allowing water to pass faster than in sand
 - C. allowing water to flow through it as fast as it does in sand
 - D. allowing water, when in excess, to flow through it
 - E. allowing less water to pass through than in sand
37. The source of humus that is present in the soil is
- A. broken down rocks
 - B. insects living in the soil
 - C. remains of dead animals
 - D. remains of dead plants
 - E. remains of dead leaving things
38. The group of foods which provide energy to the body are
- A. rice and potatoes
 - B. fruits and beans
 - C. spinach and cowpeas
 - D. cowpeas and fats
 - E. meat and fish

39. Examine the following diagram carefully and then answer the question below:



If the beam lever is in balance, the value of P in Kg is

- A. 6
 - B. 18
 - C. 24
 - D. 30
 - E. 12
40. The film in a camera is like which part in the human eye?
- A. Retina
 - B. Pupil
 - C. Choroid
 - D. Lens
 - E. Iris
41. For a physical object to be seen it must
- A. reflect light
 - B. emit light
 - C. block light
 - D. transmit light
 - E. absorb light
42. Magnetic force is always accompanied by the following:
- A. light
 - B. heat
 - C. electricity
 - D. wave
 - E. wind
43. A person standing in stagnant water without wearing shoes is most likely to be infected with
- A. tape worms
 - B. bilharzia
 - C. diarrhoea
 - D. malaria
 - E. cholera

44. Which of the following is a physical change?

- A. Dissolving sugar in water
- B. Burning of kerosene
- C. Souring of milk
- D. Burning of candles
- E. Rusting of iron

45. Which stage in the life cycle of a mosquito is most vulnerable by use of kerosene?

- A. Egg
- B. Tad-pole
- C. Lava
- D. Pupa
- E. Adult

46. Examine the following food chain in a certain conservation area:

LIONS → ANTELOPES → GRASSES

If all lions migrate to other areas,

- A. grasses will increase
- B. grasses will decrease
- C. grasses will remain the same
- D. all antelopes will die
- E. antelopes will decrease

47. Which of the following characteristics distinguishes amphibia from other animals?

- A. Laying eggs, poikilothermic, does not suckle the young ones
- B. Laying eggs, homoithermic, does not suckle young ones
- C. Laying eggs, leads both aquatic and terrestrial life
- D. Suckles young ones, homoithermic, hairy body
- E. Laying eggs, breathing through spiracles, body composed of three main parts

48. Sun hemp (marijuana) is among the plants which improve the fertility of the soil. Other plants are:

- A. cocoyam, potatoes
- B. beans, cassava
- C. potatoes, cassava
- D. beans, cowpeas
- E. cowpeas, potatoes

49. Which of the following sequences causes rainfall?

- A. Rain → ocean → water vapour → clouds
- B. Ocean → water vapour → clouds → rain
- C. Water vapour → clouds → ocean → rain
- D. Ocean → rainfall → water vapour → clouds
- E. Water vapour → ocean → clouds → rain

50. One of the functions of blood in the human body is to

- A. increase heat
- B. decrease heat
- C. excrete wastes
- D. transport oxygen
- E. digest food substances

3.8.5 Primary School Leaving Examinations 1993 - General Paper 1 (Section III: Science), (English Translation) and - General Paper 2 (Section III: Science), (English Translation)

THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

PRIMARY SCHOOL LEAVING EXAMINATIONS 1993

GENERAL PAPER 1

SECTION III: SCIENCE

Choose the most correct answer and write down the letter corresponding to that answer in front of the question number.

16. Which one of the following refers to movement in plants?
- A. Dispersal of seeds by wind
 - B. Growing away from light
 - C. Absorption of water from the soil
 - D. Spreading of branches in the air
 - E. Growing of shoots away from the stem
17. Which one of the following refers to features of insect pollinated flowers?
- A. Production of abundant pollen
 - B. Production of odourless pollen
 - C. Brightly coloured
 - D. Faintly coloured
 - E. Faint odour
18. Branches are among the main parts of a plant. Other parts are:
- A. Stem and fruits
 - B. Fruits and flowers
 - C. Roots and leaves
 - D. Roots and stem
 - E. Flowers and stem
19. Which type of blood cells are responsible for the transfer of oxygen in the animal body?
- A. White blood cells
 - B. Blood platelets
 - C. Plasma
 - D. All blood cells
 - E. Red blood cells
20. The hawk is a vertebrate animal. Others are:
- A. Snake, lizard, rat
 - B. Rat, snail, snake
 - C. Rat, bat, tortoise
 - D. Small fish, millipede, chameleon

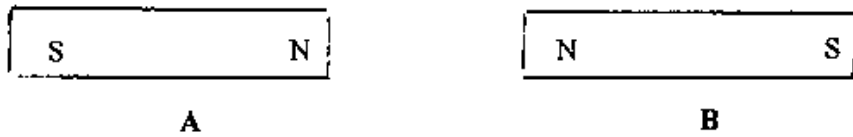
21. Villi are part of the digestive system/Other structures are:
- A. Heart, pancreas
 - B. Lungs, kidneys
 - C. Pancreas, kidneys
 - D. Tongue, large intestine
 - E. Small intestine, pancreas
22. The lung is one of the organs of the excretory system. Other organs are:
- A. Ribs and kidneys
 - B. Skin and kidneys
 - C. Ribs and heart
 - D. Heart and kidneys
 - E. Ribs and chest
23. Which of the following sets of characteristics can be used to classify animals as reptiles?
- A. They lay eggs, respire by spiracles, have three main body parts
 - B. They suckle their young, are warm blooded
 - C. They lay eggs, are cold blooded, do not suckle their young
 - D. They lay eggs, suckle their young, have hairy bodies
 - E. They lay eggs, live in water and on land
24. After Juma had analysed the soil of his farm, he found out that it was acidic. What corrective measures should be taken?
- A. Leave the farm fallow
 - B. Add a neutralizing chemical
 - C. Loosen up the soil
 - D. Practice flat cultivation
 - E. Select a particular crop for planting
25. The vulture is dependent on plants in that:
- A. It uses leaves to build its nest
 - B. It lays its eggs in tall trees
 - C. It eats the carcasses of herbivores
 - D. It hides in dense forests
 - E. It spends the nights in tall trees
26. Calcium is one of the nutrient elements contained in CAN Fertilizer. What are the other elements?
- A. Ammonia, Nitrogen
 - B. Ammonia, Nickel
 - C. Acid, Nitrogen
 - D. Aluminium, Nitrogen
 - E. Ammonia, Neon
27. Consider the following practices:
- (i) Boiling meat until it is well cooked
 - (ii) Covering the mouth with a handkerchief when coughing

If you observe these practices, you will be taking measures to control one of the following sets of diseases:

- A. Measles, roundworms
- B. Cholera, pneumonia
- C. Dysentery, cholera
- D. Measles, pneumonia
- E. Roundworms, T.B.

28. In the human body, Vitamin B³ and D prevent the following diseases:
- A. Night blindness, pellagra
 - B. Night blindness, beriberi
 - C. Night blindness, scurvy
 - D. Beriberi, scurvy
29. When two substances are mixed, a chemical change takes place if there occurs a change in:
- A. Composition
 - B. Light
 - C. Sound
 - D. Matter
 - E. Heat
30. If the upward force of water is less than the weight of a canoe, the canoe will:
- A. Sway
 - B. Capsize
 - C. Sink
 - D. Be pushed up
 - E. Float
31. The force that enables us to walk without falling is:
- A. Magnetical
 - B. Electrical
 - C. Gravitational
 - D. Frictional
 - E. Adhesional
32. How many degrees centigrade (°C) are equivalent to 158°F?
- A. 58
 - B. 98
 - C. 70
 - D. 126
 - E. 190
33. In order to load sacks of maize into a lorry, which of the following machines would you use?
- A. Pulley and wrench
 - B. Piece of timber and ladder
 - C. Ladder and a pole
 - D. Roller and ladder
 - E. Pulley and a pole
34. Soap is made by boiling a base with:
- A. An acid
 - B. An alcohol
 - C. Spirit
 - D. Fat
 - E. Salt

35.



In the above diagrams **A** and **B** are bars of magnets. If side N of Bar **A** is brought close to side N of bar **B**, the bars will:

- A. Repel
- B. Attract each other
- C. Join up
- D. Move toward one side
- E. Break

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
PRIMARY SCHOOL LEAVING EXAMINATION 1993
GENERAL PAPER 2
SECTION III: SCIENCE

Choose the most correct answer and write down the letter corresponding to that answer in front of the question number on the answer sheet.

16. Which one of the following is **NOT** a characteristic of living things?

- A. Reproduction
- B. Feeding
- C. Decomposition
- D. Growth
- E. Response

17. Which of the following is a condition for seeds to germinate?

- A. Soil
- B. Organic manure
- C. Fertilizer
- D. Heat
- E. Light

18. The seeds of "Mchungu" plant are dispersed by wind. Which of the following plants have seeds that are also dispersed in this way?

- A. Kapok and cotton
- B. Finger millet spinach
- C. Spinach and tomatoes
- D. Tomatoes and spinach
- E. Tomatoes and castor

19. Which of the following are the three major parts of an insect?

- A. Abdomen, head, wings
- B. Head, abdomen, legs
- C. Spiracles, thorax, abdomen
- D. Wings, thorax, abdomen
- E. Head, thorax, abdomen

20. Which of the following are developmental stages in the life cycle of a mosquito?

- A. Egg, pupa, larva, adult
- B. Pupa, egg, larva, adult
- C. Egg, larva, pupa, adult
- D. Larva, egg, pupa, adult
- E. Pupa, larva, egg, adult

21. Sweating is one way through which waste products are excreted from the body. Other excretory means are:

- A. Sneezing, breathing
- B. Breathing, urinating
- C. Spitting, urinating
- D. Blowing the nose, breathing
- E. Sneezing, crying

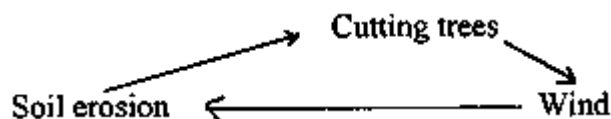
22. Which of the following sets of characteristics can be used to classify animals as MAMMALS?

- A. They lay eggs, are cold blooded, do not suckle their young
- B. They lay eggs, breathe through spiracles, have bodies divided into three main parts
- C. They lay eggs, are warm blooded, do not suckle their young
- D. They suckle their young, are warm blooded, have hairy bodies
- E. They live in water and on land, they lay eggs

23. After Pazi had conducted an experiment he found out that the soil in his farm could not drain out water easily. What corrective measures should be taken?

- A. Select a crop for planting
- B. Loosen up the soil
- C. Add a neutralizing chemical
- D. Practice flat cultivation
- E. Follow recommended number of times of weeding

24. Study the following diagram and then answer the question that follow.



Which of the following practices would you undertake to arrest persistent occurrence of the situation?

- A. Constructing ridges
- B. Planting trees
- C. Filling up gullies with soil
- D. Leaving the field fallow
- E. Practice flat cultivation

25. Apart from cow peas, what other plants enrich the nutrient status of the soil?

- A. Crotalaria, potatoes
- B. Potatoes, pigeon peas
- C. Crotalaria, beans
- D. Beans, cassava
- E. Grams, cocoyams

26. Consider the following practices:

- (i) Killing of snails by chemicals
- (ii) Constructing and using latrines properly

If you observe these practices, you will be taking measures to control one of the following sets of diseases:

- A. Measles, roundworms
- B. Pneumonia, bilharzia
- C. Round worms, dysentery
- D. Pneumonia, measles
- E. Bilharzia, dysentery

27. In the human body vitamins C and B¹ prevent the following two diseases:

- A. Beriberi, night blindness
- B. Night blindness, scurvy
- C. Rickets, pellagra
- D. Scurvy, beriberi
- E. Pellagra, scurvy

28. Which one of the following properties of light is manifested by the eclipse of the sun?

- A. Light travels in a straight line
- B. Light is reflected by an object
- C. Light is absorbed by an object
- D. Light bends when passing through an object
- E. Light passes through an object

29. Which type of lenses should a short sighted person wear to correct the defect?

- A. Convex
- B. Semi-convex
- C. Round
- D. Concave
- E. Semi-concave

30. The functions of mabbles ("goroli") in a machine are to:

- A. Lubricate the machine
- B. Reduce speed of the machine
- C. Stop movement of the machine
- D. Reduce friction in the machine
- E. Raise temperature of the machine

31. How many degrees Fahrenheit (°F) are equivalent to 40°?

- A. 72
- B. 112
- C. 80
- D. 136
- E. 104

32. How will you rescue a person affected by an electric shock?

- A. Pushing him using hands
- B. Pushing him using legs
- C. Pushing him with a dry wooden pole
- D. Pushing him with an iron rod
- E. Pushing him with a wet wooden pole

33. When lighting a torch, which of the following forms of energy is changed?

- A. Electrical
- B. Chemical
- C. Static
- D. Kinetic
- E. Magnetic

34. One of the ways of obtaining salt from a salt solution is by:

- A. Freezing
- B. Filtering
- C. Decanting
- D. Dissolving
- E. Heating

35. Which of the following refers to a change in state?

- A. Decaying of fruits
- B. Formation of steam
- C. Burning of paper
- D. Rusting of iron
- E. Souring of milk

3.9. Uganda

3.9.1. Overview

End of Primary School Examination

1.	Title of examination:	Uganda Primary Leaving Certificate Examination
2.	Amount of fees charged:	≈ US\$2
3.	Examination after years in primary school (6, 7, 8 years):	7 yrs
4.	Children's entry age in primary school:	6-7 yrs
5.	Number of pupils sitting examination in 1994:	162,695
6.	Examination subjects offered:	6 subjects in 4 papers: <ul style="list-style-type: none"> • English • Mathematics • Social Studies/Religious Education • Basic Science & Health Education (incl. Agriculture)
7.	Language of examination:	English
8.	Institution setting the examination questions:	Uganda National Examinations Board (UNEB)
9.	Have there been any reforms in the examination questions?	Yes
	When? (year)	1983
	What kind?	Replacement of multiple-choice questions by structured questions.
10.	Stages of development of examination questions (please describe):	• Setters' workshop is organized and invited setters receive basic training through presentations.

		<ul style="list-style-type: none"> • Setters write items which are shredded at the workshop. • Shredded items are later moderated. • Items accepted after moderation are compiled into papers for pre-testing. • Analysis of pre-tested items is done and some items may be remoderated. • Items are banked for use when required.
11.	Type of examination questions and distribution of different kind of questions.	Only structured questions made up of 50% recall and comprehension and 50% higher-order questions.
12.	Is continuous assessment incorporated in the final examination?	Yes [] No [x]
13.	Are examination items pretested?	Yes [x] No []
14.	Which professional groups are involved in setting the examination questions?	<ul style="list-style-type: none"> • Primary school teachers • School inspectors • Tutors of TTCs • Uganda National Examinations Board (UNEB) staff
15.	Are the same professionals who set the examination questions involved in marking papers?	Yes [x] No []
16.	How are examination results used for improving teaching in primary schools?	A report on the work of candidates is sent out to schools, pointing out weaknesses in teaching, pupil misconceptions as seen in the scripts and areas that need more indepth approach.
17.	To what other uses are the examination results put?	<ul style="list-style-type: none"> • Selection into post primary institutions. • Certification.
18.	Main problem with Primary School Leaving Examinations?	<ul style="list-style-type: none"> • Large entry which influences cost-effectiveness. • Cost of presenting items. • Tendencies to cheat by pupils and teachers.

3.9.2. Item Writing for Primary Leaving Examinations in Uganda

by Dan Nokrach Odongo, Uganda National Examinations Board

Primary education in Uganda at present ends after 7 years of formal schooling. At the end of this period, pupils sit for the Uganda Primary Leaving Certificate Examinations administered by the Uganda National Examinations Board (UNEB).

The examinations consist of 4 written papers viz. English Language, Mathematics, Social Studies and Religious Education and Basic Science and Health Education. The results of the examination are used by the Ministry of Education and Sports for placement/selection of candidates for post-primary institutions. The results also show attainment of a level of education expected after 7 years. Schools also get a feedback through reports on the work of candidates (see chapter 4: Examples of Follow-up Communications after the Examinations).

Background History of Science Syllabus

Before 1981, the Primary Leaving Certificate Examinations were administered by the Ministry responsible for Education. Science was examined as part of a General Paper of which it comprised 25%. The Chief Examinations Secretary received whole paper drafts from setters, who were usually teachers in primary schools and tutors and lecturers in teacher training colleges. The draft questions were then moderated by the Chief Examinations Secretary, the Inspector of Schools (Primary) and the Education Officer (Primary) at Ministry Headquarters.

The items generated were all of the multiple-choice type.

The break-up of the East African Examinations Council occasioned the formation of UNEB which then took over the primary examinations from 1981. The section moved to UNEB from the Ministry of Education. In 1982 changes were made in the method of generating items. An item writers workshop was organized and participants set items. The Research Department of UNEB shredded the items. A pretest of the shredded items was organized. These measures were introduced to improve the validity, reliability and security of the items.

There was also a change in the format of the Science section of the General Paper. Subsection I was made up of 15 questions of the multiple-choice type and subsection II had 6 simple structured questions.

In 1981 the Ministry of Education decided that, in order to promote Science, the Curriculum was to be expanded. The General Paper was already too loaded and a decision was taken to split it. Two papers were born out of this; Social Studies and Religious Education, and Science. The National Curriculum Development Centre (NCDC) was asked to develop a syllabus for the Science paper. The examination paper then consisted of 40 multiple-choice questions and 15 structured questions. The new Science paper was presented for the first time in 1983, allowing for a two year period for schools to note the change.

In 1984 the use of multiple-choice questions was abolished. It was felt that multiple-choice items did not encourage originality and expression on the part of candidates. The method of testing also lent itself to easy cheating by candidates. External assistance from teachers to candidates was also easy. Another problem was the lack of trained item writers - items tended to test factual knowledge only. Instead, 40 simple structured questions formed the first part and 15 more difficult ones formed the second part. By 1988 the method of item generation whereby writers submitted complete drafts was beginning to be discarded in order to improve the security of the items. The method was finally abolished in 1990.

In 1990 the Science paper underwent another major change. The syllabus was expanded to include Health Education. It was felt that pupils leaving school after the primary cycle needed to be equipped with knowledge and ability to take care of their own health and that of the community in which they live. With the assistance of UNICEF, the Science syllabus was expanded and has become Basic Science and Health Education with Health Education weighted at about 50% of the paper. The format remained the same - 40 simple structured questions (40 marks) in Section A and 15 more difficult ones (60 marks) in Section B. This paper was presented for the first time in 1991.

The Current Situation

Since 1991, items have been generated at item writers workshops. The workshop is residential, lasts 10 working days, and is organized annually.

Participants invited are classroom teachers, lecturers and tutors in teacher-training colleges, inspectors of schools in charge of primary education, curriculum experts from NCDC and health education experts from the UNICEF Uganda country office. People who are not involved in teaching other than those above are not invited. The identified participants are then vetted and cleared by the Examinations Security Committee of UNEB. Just before the 1991 workshop, UNEB organised a major item writers course conducted by senior officers of the Board to improve on the writers' abilities and, consequently, the quality of the items.

At the workshops, participants write items rather than whole papers. The items are written according to a not too rigid table of specification (see Table of Specification). This is followed by shredding of items at the workshop and later moderation of the items in UNEB offices by a team of moderators under the guidance of the subject secretary, Test Development. The items are brought together in several parallel papers for the purpose of pretesting. Schools to be used for the pretest are randomly chosen from three categories: urban, semi-urban and rural. The result of the pretesting exercise is analysed to check the behaviour of the questions - their reliability and validity indices.

The abilities tested are knowledge, comprehension and application. The higher abilities - analysis etc. - are not expected at this level.

Accepted questions are banked using the banking form (see Item Banking Form). Banked questions are ready to be used the following year.

Proposals for Improvement of the Science Paper

The NCDC and the Ministry responsible for Education have recommended that a Practical Basic Science and Health Education paper be set. A sample paper has been submitted to UNEB. The constraints here are the volume of equipment needed at this level - about 180,000 candidates. Most schools do not have laboratories or workshops, or science equipment. The financial aspect is the other big constraint. Whereas the idea has, at the moment, been shelved, committees in both UNEB and NCDC are working towards the goal of having a practical paper included alongside the theory one. Further training of item writers and the development of tests is planned.

Uganda National Examinations Board Primary Leaving Examination/Table of Specification

Unit	Section A			Section B		
	K	C	A	K	C	A
1. Our Environment	-	-	-	-	1	-
2. Changes in our Environment	-	1	-	-	-	-
3. Crop Husbandry	2	-	-	-	-	1
4. Animal Husbandry	1	1	1	-	-	-
5. Systems of Mammals	2	1	1	-	1	-
6. Our Health	1	1	-	-	-	-
7. Common Diseases	2	-	-	-	-	1
8. Air/Water and Weather	1	1	1	-	1	-
9. Food and Nutrition	2	1	-	-	1	-
10. Classification and Study of Living Things	1	1	-	1	-	-
11. The Flowering Plants	1	-	1	-	-	-
12. Measurement	-	1	-	-	-	1
13. Forms of Energy	3	1	-	1	-	-
14. Simple Machines	-	1	-	1	-	-
15. Accidents and First Aid	1	1	-	1	-	-
16. Family and Social Problems	1	1	1	1	-	-
17. Sanitation	-	1	-	1	-	-
18. Immunisation	-	1	-	1	-	-
19. Primary Health Care	2	1	-	1	-	-
Total	20	15	5	8	4	3

Note: Section A = simple structured questions; Section B = more difficult questions; K = Knowledge; C = Comprehension; A = Application

IBF/1

ITEM ID _____
LEVEL _____

Uganda National Examinations Board

Item Banking Form

Subject _____
 Topic _____
 Sub-Topic _____
 Objective _____
 Ability Level _____
 Author/Source _____ Year _____

Usage Data

	Year	P-value	D-value	V-index	R-index	Remarks
1						
2						
3						
4						
5						

Question:

3.9.3. The Uganda Primary Leaving Certificate Examination in Basic Science and Health Education

by Zacky W. Eriko, Uganda National Examinations Board

1. Introduction

Several forces have greatly contributed to our current practices as regards the Uganda Primary Leaving Certificate Examination (PLE), the main features will be described later. The main forces include:

(1) Criticisms of the PLE

The commonest criticisms levelled against the PLE include:

- that it has made teaching be geared towards passing the examination only - i.e. the »examination tail« wagging the »curriculum dog« in that whatever is not examined at PLE remains either untaught or taught poorly;
- that most of the questions were of the »recall« type, testing lowest cognitive levels, hence encouraging rote learning rather than understanding or other higher cognitive abilities and skills;
- that the examination tended to favour urban school children and discriminated against rural schools;
- that too much was being demanded from the candidates such that teaching has turned into coaching; that this is done seven days a week, from January to November, hence learning becomes a torture rather than a pleasant experience for children, exerting severe physical and psychological strains on children and financial strains on parents;
- Some people even believe that a very limited area of the primary school curricula is being tested; such people tended to argue that the PLE should be expanded to cover subjects like Music, Physical Education, Art and Crafts, etc.

(2) Examination Malpractices

Over the past few years, the Board had noticed that malpractices in the examination at primary level were becoming an issue of great concern. The public on their part have not minced words in accusing the staff of the Board (in most cases erroneously) for the malpractices. They have always shouted »leakage« at every case of examination malpractices. The malpractices in the PLE fall in three broad categories: Irregularities, Misconduct and Dishonesty or Cheating. The last category, the most serious of the three, is composed of: leakage, collusion, copying, external assistance, impersonation, smuggling and substitution - of all these, the public is not aware of. They persistently think

that every case is due to leakage of exams.

(3) Psychometric Considerations

As more and more of the Board's staff became acquainted with the modern techniques of measurement and evaluation, but educational assessments in particular, shortcomings were identified and changes introduced.

2. Generating Test Items and Preparation of PLE Basic Science and Health Education Paper

It is a matter of fact that setting good test items cannot be done by accident. It requires special skills that can only be acquired through training and experience. In this regard, therefore, all those experienced and dedicated teachers used by the Board as setters in the PLE have had to be carefully identified, vetted, trained and tested before being commissioned to do the job.

Due to some of the reasons given already above, the Board employs two methods of generating items that go into the PLE Basic Science and Health Education Paper:

(1) Through different people being asked to set parallel papers based on a specification grid. This has the advantage of proper balance of the various aspects of the syllabus and coherence.

(2) Through item-writers workshops in which active classroom teachers at that level, inspectors, subject specialists at the National Curriculum Development Centre and tutors in Primary Teachers' Colleges participate.

The emphasis in both cases is on having been subjected to training on test construction techniques by the Board first.

The items so generated, whether through parallel papers or workshops, or later in schools are shredded/moderated compiled into fresh papers pre-tested and analysed for level of difficulty as well as discrimination ability before being banked as items (not as papers).

At a later stage, the banked items are used to compile at least three parallel papers which are looked at by a moderation panel and later vetted and re-adjusted by a small group of the top secretariate. In this way loop-holes which could result in possible leakage of the exam are totally sealed.

3. Format of the Examination and its Administration to Candidates

(1) Format of the paper: The instructions to the candidate on the front page of the exam paper clearly state that the paper has two sections: A (made of 40 short answer questions - 40 marks); and B (15 questions - 60 marks).

The questions in section A cover a much wider area and they all carry equal marks. Those in section B cover fewer areas but in depth. The whole paper is for 2 hours 15 min. It covers Physical and Biological Sciences, Agriculture and Health Education.

(2) Administration of the PLE: Schools within a reasonable radius are grouped together at one centre and each of the examination rooms used must have representatives from each of the schools sitting there. Supervisors at each centre are appointed by the Board and these are usually qualified and experienced secondary school teachers and tutors of PTCs. The invigilators, on the other hand, are primary school teachers, appointed by the District Inspector of Schools but not from the schools sitting at a particular centre. Candidates' passport size photographs are used to identify the candidates. Through these and other measures not discussed here, the Board has been able to drastically minimize examination malpractices in the PLE.

4. Grading/Award of Certificates

The Board does not have a pre-determined boundary for a pass mark. The decision of cut-off points at grades 2, 6 and 8 are arrived at during an awards meeting in which the Chief Examiner of the paper assesses the level of difficulty of the paper (item by item) and performance by the candidates. The remaining intermediary scales on a modified 9-point scale are then worked out statistically, such that the best score is a One and the worst a Nine.

The certificate awarded is determined by the total aggregate score in the four papers and range from division 1 to 4. Those below that are ungraded.

5. Proposed Reforms

Uganda is about to embark on a massive reform of its education system at both primary school and Primary Teachers' Training levels. The National Examining body is seen to be playing a central role in this proposed World Bank financed reform. Some of the specific roles that the Board will be expected to play include:

- Introducing and incorporating continuous assessment into the examination system;
- Conducting national assessment of educational progress;
- Increasing the level of test items in the PLE to those testing higher cognitive abilities as well as relating questions to live situations; and
- Improving on feedback systems to schools and parents.

3.9.4 Uganda Primary Leaving Certificate Examination 1994 - Basic Science and Health Education

UGANDA NATIONAL EXAMINATIONS BOARD

UGANDA PRIMARY LEAVING CERTIFICATE EXAMINATION

BASIC SCIENCE AND HEALTH EDUCATION

Time Allowed: 2 hours 15 minutes

Name.....

Index No									
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DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

Read the following instructions carefully:

1. The paper is made up of two Sections: A and B.
2. Section A has 40 short-answer questions (40 marks).
3. Section B has 15 questions (60 marks).
4. Attempt **ALL** questions. All answers to both Sections A and B must be written in the spaces provided.
5. All answers must be written in blue or black ball-pen or ink. Only diagrams and graph work may be **done** in pencil.
6. Unnecessary alteration of work will lead to loss of marks.

7. Any handwriting that cannot easily be read may lead to loss of marks.

FOR OFFICIAL USE ONLY			
SECTION	EXRS MARKS	T/L MARKS	OFFICE
A			
B			
TOTAL			

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1994

Turn over

SECTION A

1. How does uncontrolled burning affect our environment?

.....

2. State one method by which breast milk protects newly born babies.

.....

3. In the space provided below, draw a simple diagram of a molar tooth.

4. State one way in which earthworms are important to a farmer.

.....

5. How does the sun-ray help in the formation of rain?

.....

6. What takes place in the lungs when one breathes in and out?

.....

7. John is suffering from a headache. The nurse wishes to measure John's body temperature. Why does she put the thermometer under John's arm-pit and not on his head?

.....

8. How does government control the spread of a cattle disease when it breaks out in an area?

.....

9. How does the skin of a person maintain his body temperature on a hot day?

.....

10. Why is it not necessary for a VIP latrine to have a lid for the hole?

.....

11. Why is it not good to pour paraffin into a pit latrine?

.....

12. A 14 year-old child who is usually well behaved suddenly becomes rude to the parents. State one possible change in the child responsible for such a behaviour.

.....

13. What is the advantage of family planning to a mother?

.....

14. Why would the control of AIDS be easier than that of malaria?

.....

15. Why does milk left in the open become sour after some time?

.....

16. A child is found to be dehydrated. What is a possible cause of this dehydration?

.....

17. What causes anaemia?

.....

18. How does smoke from a fire in a room reach other areas in the same room?

.....

19. A block of wood of volume 24 cm weighs 36 grams. What is its density?

.....

20. A female fish lays eggs in the water. How are these eggs fertilized?

.....

21. What type of change takes place when a candle melts?

.....

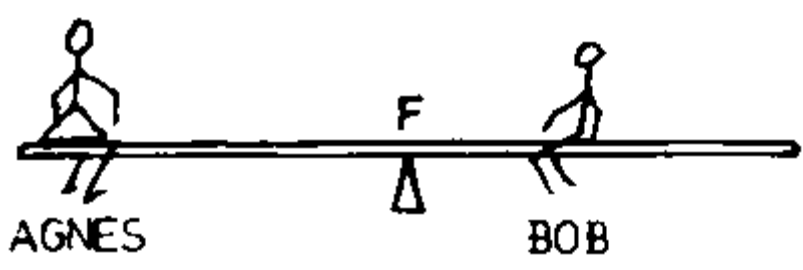
22. Pregnant women are advised to receive immunization against Tetanus. What is the importance of this immunization to the unborn child?

.....

23. State any one first aid you would give to a patient who is bleeding from a deep cut on the leg.

.....

24. Bob and Agnes are sitting, balanced, on a sea-saw as shown in the diagram below.



How does the diagram show that Bob is heavier ?

.....

25. Why does the heart of a person who is running beat faster than normal?

.....

26. State one advantage of crop-rotation.

.....

27. What is the difference in movement between a ball and socket joint and a hinge joint?

.....

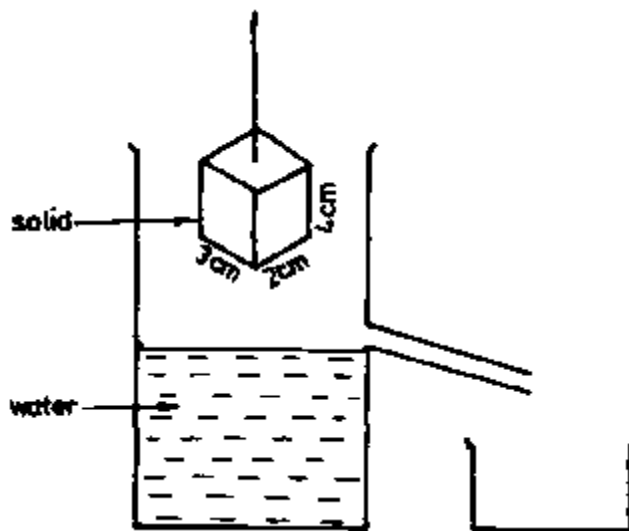
28. Why should materials made of iron be covered with paint?

.....

29 Fish, reptiles and birds are vertebrates that lay eggs. State one other characteristic which is common to them.

.....

The diagram below shows an experiment used to find the volume of a regular solid block. Use it to answer questions 30, 31 and 32.



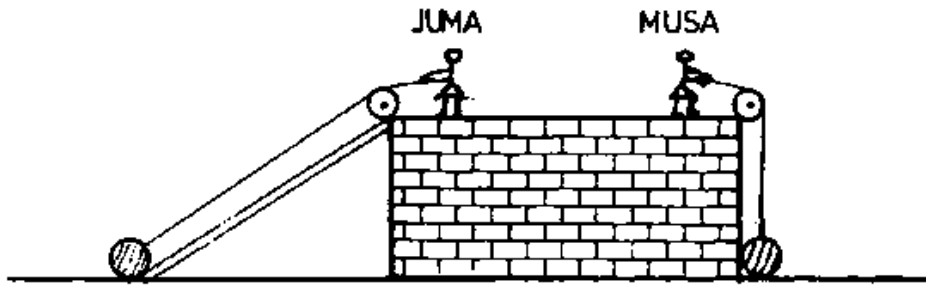
30. What is the volume of the block?

31. If the solid block is lowered into the overflow can, what volume of water will be displaced?

32. How would you confirm your answer to question 31 above?

.....

The diagram below shows two boys, Musa and Juma, pulling pieces of wood of equal weights up a wall. Use it to answer questions 33 and 34.



33. Which boy will use less force to pull the wood?

.....

34. Explain your answer to question 33 above.

.....

35. Why is resting important for the health of a person?

.....

36. Muhima is sitting on a chair inside a room. Both his feet are bare. His left foot is resting on a bare cemented floor. The right foot is resting on a mat. Why would Muhima's left foot feel colder than the right foot?

.....

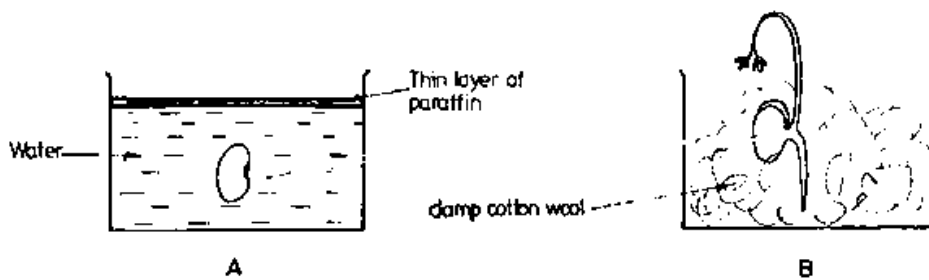
37. Why is smoking of tobacco harmful to the body?

.....

38. What is the main purpose of marriage?

.....

A student was finding out the conditions needed for germination of beans to take place. She set up the experiment as shown in the diagram below. Use it to answer questions 39 and 40.



39. Why did the seed in A not germinate?

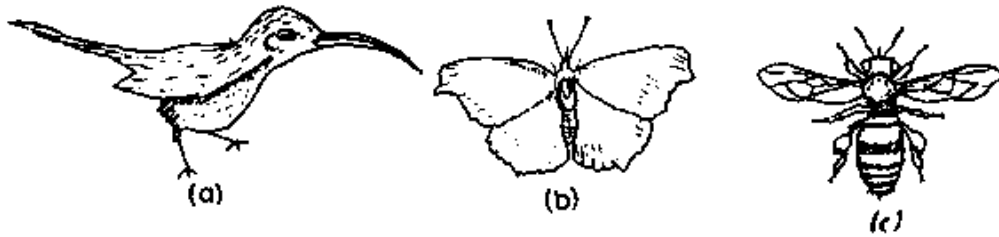
.....

40. What is the purpose of the wet cotton wool in B?

.....

SECTION B

41. Use the diagram below to answer the following questions.



(a) In what ways do these animals have similar structures for:

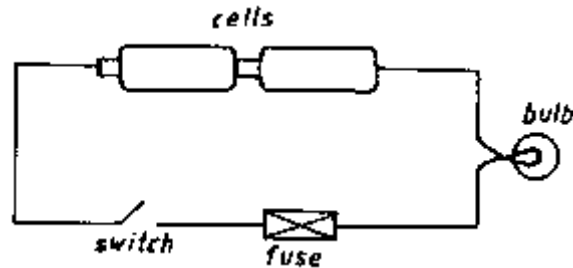
(i) feeding?

(ii) pollination?

(iii) movement?

(b) How does one of the animals differ from the other two in its life history?

42. In the circuit below, when the switch was closed, the bulb lit.



(a) How would you increase the brightness of the light in the bulb?

(b) After a short time, when the switch was still on, the light in the bulb went off. State three possible causes for the light going off.

- (i)
- (ii)
- (iii)

43. (a) A farmer who practises mixed cropping has the following crops to plant: beans, cassava, groundnuts and potatoes.

(i) Which two crops would be advisable for the farmer to plant together?

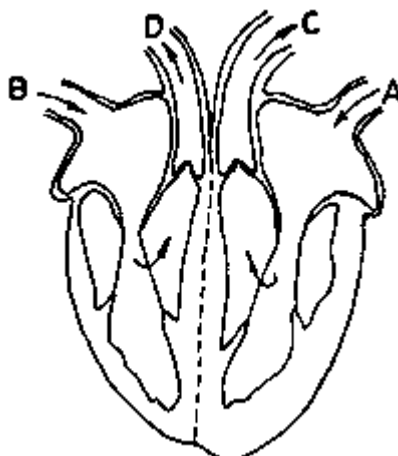
(ii) Give a reason for your answer.

(b) The farmer used a garden for planting maize crop only for three consecutive years (planting seasons). During the harvest in the third year, he noticed a drop in the maize yield.

(i) Suggest a reason for the drop in the maize yield.

(ii) How can the farmer improve his maize yield in the same garden without using fertilizers?

44. The diagram below is of a human heart. Use it to answer the questions which follow.



(a) What is the function of valves in the heart?

.....

(b) What is the difference between the blood which enters the heart through **A** and that through **B**?

.....

(c) After leaving the heart at **C** and **D** where does the blood go?

(i) **C**:

(ii) **D**:

45. In the table below, some of the diseases are given with their symptoms and prevention/control. Study it and fill in the missing information.

Name of Disease	Symptoms	Prevention/Control
Sleeping sickness	loss of body weight, drowsiness, swelling in the joints	
Common cold (flu)		Isolation, Avoid infected people
Measles	rash on body, high fever, cough, red eyes, sore in mouth diarrhoea and vomiting.	
	mild redness and itching of eyes, pus in eyes after sleep, scarring.	washing of eyes, avoiding to share articles with sick persons, e.g. basin towel. Medical treatment

46. (a) Why should water not be used to put out fire from petrol which is burning?

(i)

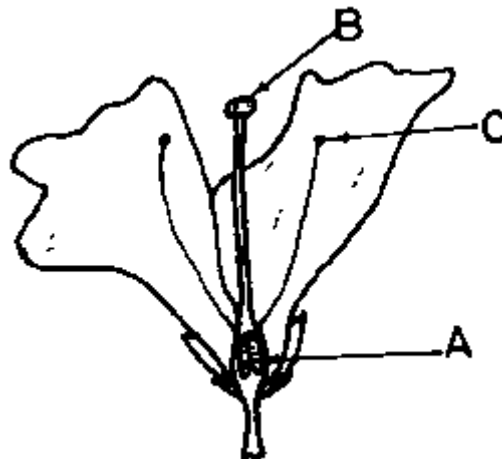
(ii)

(b) Suggest two ways by which fires from petrol burning can be put out.

(i)

(ii)

47. The diagram below is of a flower. Use it to answer the questions which follow.



(a) What does the part labelled A become after fertilization?

(b) What is the difference in the functions of the parts labelled B and C?

- (i)
- (ii)

(c) Of what value are flowers to man?

48. When a drum is hit, you hear sound.

(a) How does the ear-drum help you to hear the sound?

(b) There is some wax in the outer ear. What is the function of the wax?

(c) What is the effect of too much wax in one's ear?

- (i)
- (ii)

49. (a) State two factors which should be taken into account when selecting site for building a house.

- (i)
- (ii)

(b) How does a well-built house contribute to the health of a family?

- (i)
- (ii)

50. The diagram below shows how seeds change into young plants. Use it to answer the questions which follow.



(a) What is the main difference between the type of germination shown in **A** and that in **B**?

- (i)
- (ii)

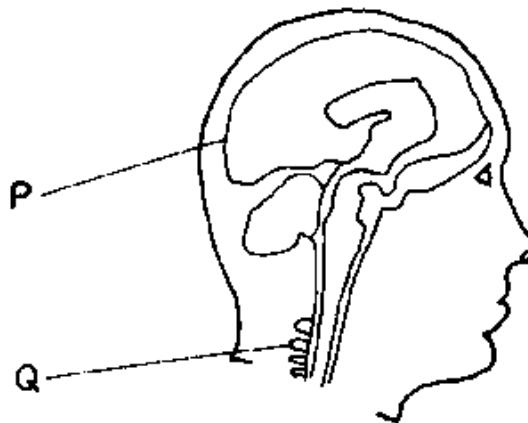
(b) Which of these two types of germination is more common in monocotyledonous plants?

.....

(c) In what way does the location of the food store in **A** differ from that in **B**?

.....

51. Use the diagram below to answer the questions which follow.



(a) What name is given to the part marked **P**?

.....

(b) Give a function of the part marked **Q**.

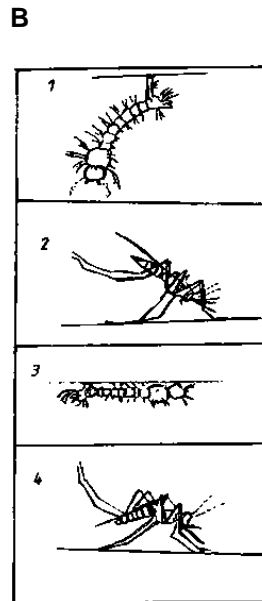
.....

(c) Name two sense organs shown in the diagram above, by which someone can tell that there is something burning.

- (i)
- (ii)

52. List A below gives two types of mosquitoes. The drawings in B give the larvae and adult stages of mosquitoes. Write the correct number of the drawing in B against the correct mosquito in list A. Each drawing in B can be used once, more than once or not used at all.

A
 Anopheles
 Culex



53. Nakato harvested her maize crop and dried it. She put the maize in a sack and stored it on the floor, in a corner of her bedroom. Akello also harvested and dried her maize crop. Then she hung the maize on cobs above a fire place in the kitchen.

(a) Explain why Akello would have better maize grains to plant in the next season.

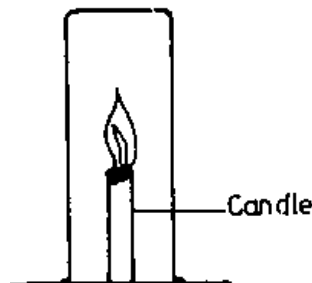
(b) Give two ways in which Nakato can improve on her storage method.

- (i)
 (ii)

54. (a) What shows that air is matter?

- (i)
 (ii)

(b) A candle is lit and placed inside a container and sealed as shown in the diagram below.



(i) Why does the candle continue burning for some time inside the sealed container?

(ii) Give a reason why the candle light goes off after some time.

55. (a) State four reasons why physical exercises are good for the body.

- (i)
- (ii)
- (iii)
- (iv)

3.9.5 Uganda Primary Leaving Certificate Examination 1993 - Basic Science and Health Education

**UGANDA NATIONAL EXAMINATIONS BOARD
UGANDA PRIMARY LEAVING CERTIFICATE EXAMINATION
BASIC SCIENCE AND HEALTH EDUCATION**

Time Allowed: 2 hours 15 minutes

Name.....

Index No									
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DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

Read the following instructions carefully:

1. The paper is made up of Sections A and B.
2. Section A has 40 short-answer questions (40 marks).
3. Section B has 15 questions (60 marks).
4. Attempt **ALL** questions. All answers to both Sections A and B must be written in the spaces provided.
5. All answers must be written in blue or black ball-point pen or ink. Only diagrams and graph work may be done in pencil.
6. Unnecessary alteration of work will lead to loss of marks.
7. Any handwriting that cannot easily be read may lead to loss of marks.

FOR OFFICIAL USE ONLY			
SECTION	EXRS MARKS	T/L MARKS	OFFICE
A			
B			
TOTAL			

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1993

SECTION A

1. Jane put a bottle of soda in a bucket full of ice. Two hours later, she found that the soda was frozen and the bottle broken. Why did the bottle break?

.....

2. What is the role of brightly coloured petals in pollination?

.....

3. State one reason why loam soil is better than sandy soil for crop growing.

.....

Use the drawing below to answer questions 4 to 8.



4. Which of these animals lay eggs?

.....

5. Which of these animals are cold-blooded?

.....

6. Which one of these animals has no back-bones?

.....

7. Which of these animals can fly?

.....

8. Which one of these animals is a mammal?

.....

9. Why would an egg from a layer not hatch into a chick after it has incubated for 21 days?

.....

10. The chameleon is a slow-moving animal. State one way by which it protects itself.

.....

11. Why is breast milk the best food for a baby of less than one year old?

.....

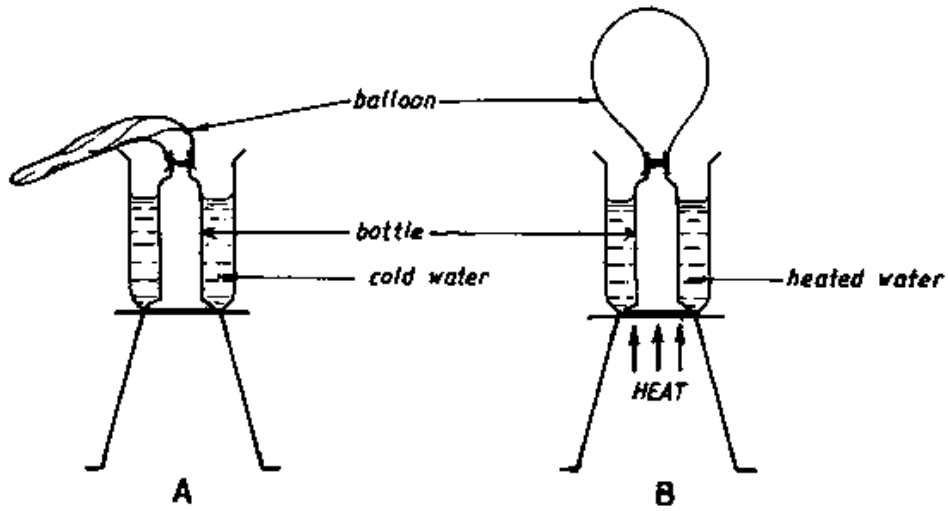
12. Why should left-over food be properly covered?

.....

13. What causes malaria?

.....

The diagram below shows a set-up of an experiment and its results. Use it to answer questions 14 and 15.



14. Why does the balloon swell out as shown in B?

.....

15. Suggest what you think the experiment is intended to show.

.....

16. Why are people encouraged to drink boiled water?

.....

17. Why must fruits and green vegetables be included in our diet?

.....

18. Why does a pregnant mother need foods rich in proteins?

.....

19. Why should finger-nails be kept short?

.....

20. Why is the maize grain considered a fruit?

.....

Use the drawing below to answer questions 21 and 22.



21. What stage in the life cycle of a cockroach is shown in the diagram?

.....

22. Give a reason for your answer to question 21.

.....

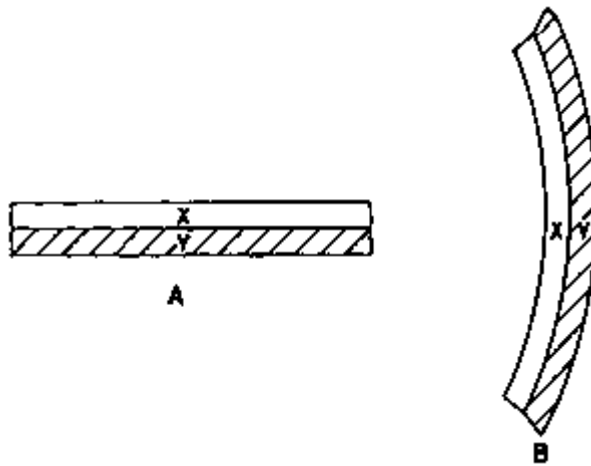
23. How does a cassava plant obtain its food when its leaves have fallen off?

.....

24. Why does a piece of stone placed into water sink?

.....

The diagram below shows a metallic rod made of two different metals (X and Y) bound together as shown in **A**. When heated, the rod bends as shown in **B**. Use the diagram to answer questions **25** and **26**.



25. Which of the metals expands faster, X or Y?

.....

26. Give a reason for your answer to question 25.

.....

27. What is the function of a dry cell?

.....

28. Why does a wet cloth spread on a line inside a house dry?

.....

29. What is a compound fracture?

.....

30. What First Aid should be given to a person who gets a compound fracture on the arm?

.....

31. Why must one avoid being near a person smoking?

.....

32. Of what use is a ventilator of a house?

.....

33. What do you understand by 'drug dependency'?

.....

34. What vector(animal) carries the bubonic plague germ?

.....

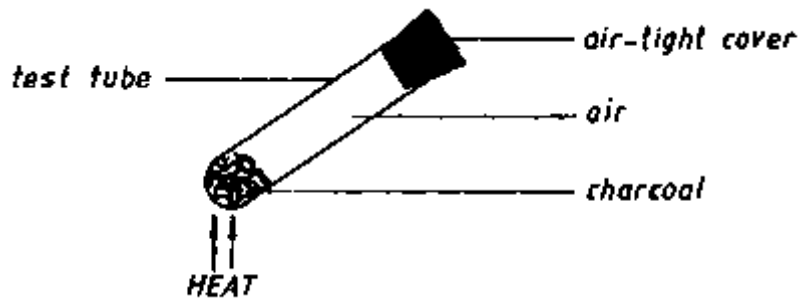
35. Why should pit-latrines be smoked from time to time?

.....

36. Tonto shares his hut with goats. State one disadvantage of this practice.

.....

37. Some charcoal is burnt in a container as shown in the diagram below. The container and its contents were weighed before and after burning. There was no change in the weight. Why was there no change in weight?

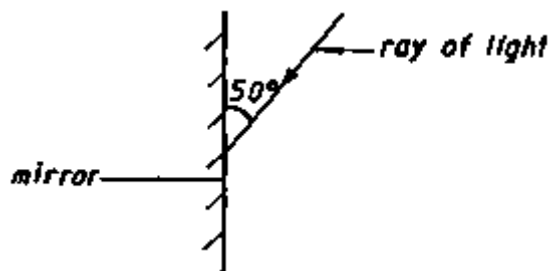


.....

38. State one cause of fainting.

.....

39. A ray of light meets the surface of a mirror as shown in the diagram below. Draw the reflected ray. (N.B. Use of compass not necessary).

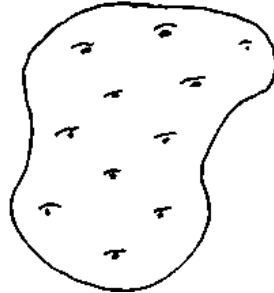


40. What is the importance of weeding in growing crops?

.....

SECTION B

41. The diagram below is of an Irish potato. Use it to answer questions (a) to (d).



(a) What part of the Irish potato is shown in the diagram?

.....

(b) Give a reason for your answer in (a).

.....

(c) What main food value does the Irish potato have?

.....

(d) How does the method of propagation of Irish potato differ from that of sweet potato?

.....

42. The table below gives a list of diseases against which children should be immunized and the age in months in which the first dose of vaccine should be given.

(a) Study the table carefully and fill in the missing information.

DISEASE	AGE IN MONTHS
(i) Tuberculosis	
(ii) Tetanus	1½ months
(iii)	1½ months
(iv)	9 months

(b) What is the importance of a health card?

.....

43. (a) Give two possible sources of worm infection.

- (i)
- (ii)

(b) State two signs of worm infection.

- (i)
- (ii)

44. Uganda Electricity Board generates most of its electricity at Jinja.

(a) State the source of the electrical energy.

.....

(b) How does the electricity generated at Jinja get to a consumer in Kampala?

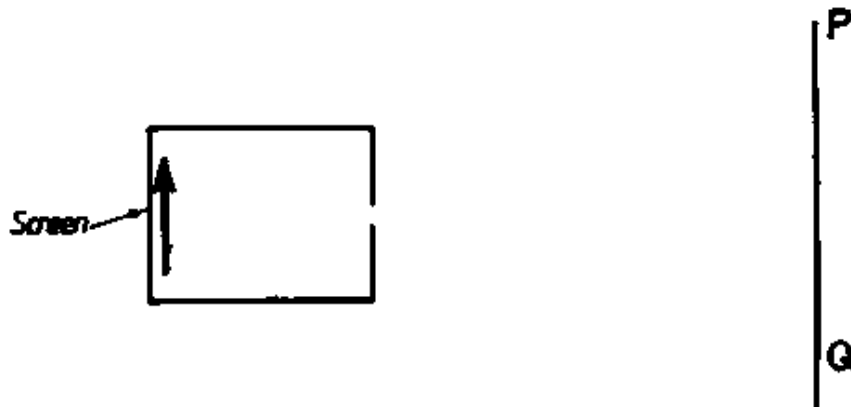
.....
.....

(c) Give two uses of electricity to a family.

(i)

(ii)

45. Below is a drawing of a pin-hole camera, with an image of an object formed on the screen. The object is located along line PQ.



(a) Draw lines to show how the image of the object is formed.

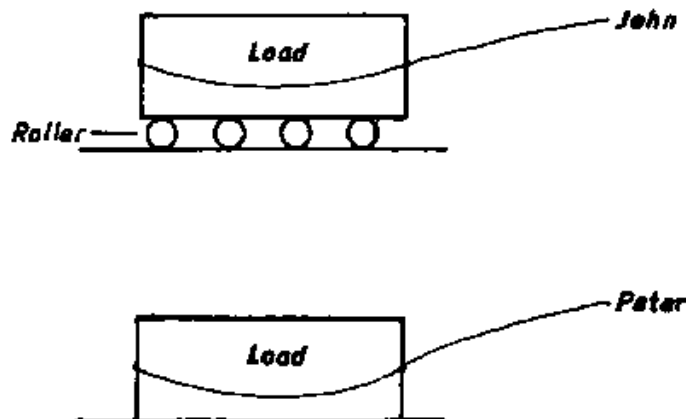
(b) Draw the object.

(c) Compare the object and the image.

(i)

(ii)

46. John pulls a load of 50 kg over a set of metal rollers. Peter pulls another load of the same weight along the ground (see diagram below).



(a) Explain why one of the two (people) uses less force.
.....

(b) What is the advantage to a driver of pouring sand on a slippery road?
.....

(c) Explain your answer in (b) above.
.....

47. The AIDS virus does not kill its victims.

(a) What leads a person infected with the AIDS virus to death?
.....

(b) Why should one not be afraid of sitting in the same classroom with someone infected with the AIDS virus?
.....

(c) What is the commonest method through which the AIDS virus is spread?
.....

48. (a) How does each of the following help to maintain soil fertility:

- (i) Crop rotation?.....
- (ii) Mulching?.....

(b) Give two other ways of maintaining soil fertility.

- (i)
- (ii)

49. A child suddenly removed the cover of a sauce-pan full of boiling water. One arm of the child was thereby burnt by the steam.

(a) What kind of burn did the child get?
.....

(b) What First Aid would you give to the child?
.....

(c) Give two possible ways by which such accidents could be prevented.
(i)

(ii)

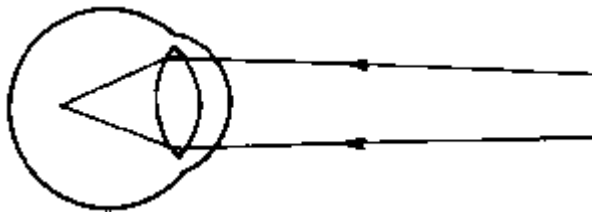
50. (a) Give two types of cattle.

- (i)
- (ii)

(b) Why are cattle-keepers encouraged to practise paddock system of grazing?

- (i)
- (ii)

51. Below is a diagram showing an eye defect.



(a) Name the eye defect shown in the diagram above.

.....

(b) Give reasons for your answer in (a) above.

(i)

(ii)

(c) How can this eye defect be corrected?

52. (a) State two functions of mammalian teeth.

(i)

(ii)

(b) An elderly man has lost all his molar teeth. What feeding problem would he experience?

(i)

(ii)

53. (a) Give two reasons why burning and rusting are considered similar reactions.

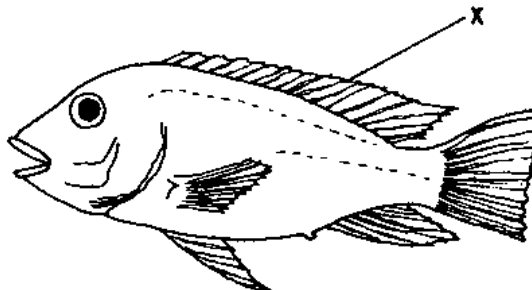
(i)

(ii)

(b) A farmer notices that whenever he leaves his hoe outside the whole day, on a clear day, it does not rust; but whenever he leaves the same hoe outside at night, it rusts. Why is this the case?

.....

54. The diagram below is of a fish. Study it and use it to answer the questions that follow.



(a) Name the part labelled X.

(b) Mark with Y the position of the gills.

(c) How does a fish take in oxygen?

.....

55. (a) What is an essential drug?

.....

(b) Give an example of an essential drug.

.....

(c) Why are prescriptions important in the treatment of sicknesses?

(i)

(ii)

3.10. Zambia

3.10.1. Overview

End of Primary School Examination

- | | | |
|-----|---|---|
| 1. | Title of examination: | Grade VII Composite Examination |
| 2. | Amount of fees charged: | ≈ US\$ 1 |
| 3. | Examination after years in primary school (6, 7, 8 years): | 7 yrs |
| 4. | Children's entry age in primary school: | 6-7 yrs |
| 5. | Number of pupils sitting examination in 1994: | 179,148 |
| 6. | Examination subjects offered: | 6 subjects (including Zambian Languages) tested in 5 papers: <ul style="list-style-type: none">• English• Zambian Languages• Mathematics• Environmental Science (incl. Agriculture)• Social Studies In addition Special Papers are set in Mathematics & English to test the IQs of children (aptitude tests). The paper on Zambian Languages does not count for the selection for secondary school. |
| 7. | Language of examination: | English (except for Zambian Language papers) |
| 8. | Institution setting the examination questions: | Examinations Council of Zambia |
| 9. | Have there been any reforms in the examination questions? | NOT YET
The Council is working on an examination syllabus to improve the examinations. |
| 10. | Stages of development of examination questions | of • Primary school teachers and college lecturers submit items to the Council. |

- Items are scrutinized and moderated by the selecting panel.
 - Selected items are pre-tested in October/November.
 - Pretest papers are marked and item analysis produced.
 - Selecting panel chooses items for the final paper.
 - Final examinations take place.
 - Past examination item analysis is done.
11. **Type of examination questions and distribution of different kind of questions.** Multiple-choice:
30% knowledge
40% comprehension
20% application
10% problem solving
12. **Is continuous assessment incorporated in the final examination?** Yes []
No [x]
13. **Are examination items pretested?** Yes []
No [x]
14. **Which professional groups are involved in setting the examination questions?**
- Primary school teachers
 - Secondary school teachers
 - School inspectors
 - Tutors of TTCs
 - Curriculum specialist
15. **Are the same professionals who set the examination questions involved in marking papers?** Yes []
No [x]
- If no, who marks the papers (state)?** Computer marks and processes
16. **How are examination results used for improving teaching in primary schools?** Not officially, but teachers use the results to judge the effectiveness of their teaching methods
Completion of the syllabus
17. **To what other uses are the examination results put?**
- Selection to grade VIII
 - Certification
 - To generate statistical reports
18. **Main problem with Primary School Leaving Examinations?** The quality of test items in all the subjects (most items are of the recall type)

3.10.2. State-of-the-Art of End of Primary Education Examinations in Zambia

by Simon I. Phiri, Examinations Council of Zambia

Introduction

Primary school education lasts seven years from Grade I to Grade VII. The children enroll for Grade I when they are six to seven years old and normally take the Grade VII examinations when they are 13 or 14 years old. Universal primary education has almost been attained in most regions of the country.

Every year in the first or second week of November, Grade VII Composite Examinations are

held throughout the country following the laid down timetable and examination regulations.

Purpose of Examination

The main purpose of the examination is twofold:

(1) Selection for Grade VIII - limited places available - selection of the best candidates takes place.

- It is hoped that in future this examination will not be necessary once universal education up to Grade IX is achieved.
- Selection for Grade VIII is governed by the availability of places in Grade VIII.

(2) Certification - all candidates who take the examination are awarded certificates. There is no fail grade at this level.

Those not selected for Government, ZCCM Trust and Mission Secondary Schools and Basic Schools are absorbed by the following schools:

- Correspondence schools known as Open-Day Secondary Schools,
- Private schools,
- Academic Production Unit Classes Schools,
- Night schools.

Selection for Grade VIII is based on the number of points in six subjects a candidate scores (standard scores). The successful candidate will be the one who scores above a regional cut-off point. Boys and girls have different cut-off points. The cut-off points vary from region to region and depend on the number of places available in Grade VIII in a particular region.

Girls normally have a lower cut-off point than boys because:

- (1)** the drop out rate is higher for girls than boys, especially when the girls reach maturity age;
- (2)** there is less emphasis by parents for girls to be in school, they prefer boys to attend;
- (3)** due to a number of factors girls generally score lower marks than boys in all of the regions of the country.

Due to (1) and (2) the number of girls in school is lower than that of boys, although the female population in the country is greater than that of males by a ratio of 1.2 to 1.0. In most schools the ratio of female to male is 1:1.5. In order to address the imbalance, the government deliberately lowers the cut-off points for girls so as to increase the ratio of females selected for Grade VIII.

Type of Examination

Most Grade VII candidates sit for seven subjects namely English, Social Studies, Mathematics, Environmental Science, Special Paper One (Verbal Reasoning), Special Paper Two (Non-Verbal Reasoning) and one of the seven official Zambian languages. Candidates in trust and private schools do not sit for any Zambian language.

All the question papers consist of multiple-choice type of questions. The number of items is normally 50 or 60 depending on the subject. The candidates answer the questions on the answer cards provided by the Examinations Council of Zambia. They do this by shading what they perceive to be the correct response to an item.

The answer cards are marked and processed by computer, mainly because of the large number of candidates and because it makes it easier to:

- standardise the scores,
- produce selection listing for both sexes in order of merit for selection purposes,
- produce various statistics,
- print certificates.

Advantages and Disadvantages of Multiple-Choice Type of Examination

Advantages

- Quick processing of examination results.
- Non-human subjectivity in the marking of the cards - marking is objective.

Disadvantages

The examination does not offer the candidate the opportunity to show any originality and encourages rote learning. Quite a number of candidates cannot even spell or write their own names. The examination does not ask or test for such skills so the teachers and the candidates do not bother about them. In future a short written component will be set to reverse this anomaly.

Test Development for Examinations

Every year the Research and Test Development Unit of the Examinations Council of Zambia pretests all the items, except Zambian languages items, that will be offered in the examinations. Two papers are prepared in each subject. The pre-tests sample is taken from the candidates for that year's examination. The pre-tests are conducted in October/November when it is assumed that the candidates have completed the syllabus and are ready for examinations.

The pre-test items are analysed by the computer to find out their suitability for use in the final paper. The item analysis shows the facility value (percentage of candidates selecting an option) and the discrimination index (how the question discriminates the able from the less able candidates). For an item to be included in the final paper it should have a facility value of 40-70% and a discrimination index (or point biserial) of above 0.20. The items that are rejected may be retested after they have been reviewed. The selected good items are put in the item bank.

Both the pre-tests and the final papers are set according to the test specification of each subject.

Item Writing for Examinations

(1) Subject secretaries (employees of the Examinations Council of Zambia) send invitations for submission of items to primary school teachers and primary school teacher training lecturers countrywide. Each item writer is expected to submit at least 25 items. The teachers who submit items are paid regardless of the quality of the items. Each subject must have at least 20 item writers. The teachers are free to choose the subject area they feel they are competent in. Invitations for items are sent for all the six subjects examined at Grade VII level except the seven Zambian languages.

(2) Upon receipt of the items the subject secretaries scrutinize them with a view to reviewing and improving some of the items that may not be so perfect in construction. The selected items are then presented to a setting panel committee. The committee consists of a chairman and three to four other members including the subject secretary. The task of this committee is to come up with two full, separate papers in their subject for use in the current year's pre-test in October/November. Each paper must satisfy the test specifications for the subject.

(3) The pre-test answer cards are marked and analysed by computer, and item analysis

printouts are produced.

(4) The subject secretary and the other setting panel members meet to select items for the final paper. The items are chosen according to whether they satisfy the two parameter ranges. The preferred range for facility level is 40-70% and for discrimination index the range must be above 0.20. The final paper is also set as per test specifications. This may vary from year to year but not much.

(5) After the final examination post-exam item analysis is done. The common feature for 1991 examinations e.g. is that items analysed as difficult in the pre-tests' analysis turned out to be easy - i.e. facility value was higher.

(6) The previous test specification for Science was in favour of recall-type of items. They contributed over 50% of the items in theory but in practice the paper actually in some years was over 80% recall. Beginning in 1991 an effort was made to reduce recall-type items from 50% to 30% and a new test specification was drawn up in consultation with the Curriculum Development Centre. This new test specification was implemented in the 1992 Environmental Science paper.

The Examinations Council of Zambia is working on an examination syllabus which will be different from the syllabus designed by the Curriculum Development Centre. This is because some objectives which were being tested do not contribute to the child's development after school.

(7) For the items to improve, workshops for item writers are essential.

Conclusion

The Grade VII Composite Examination is an examination which marks the end of Primary School Education. The results are awaited with much anxiety by both the candidates and their parents. This is so because of the low progression rate to Grade VIII. For most people this examination, if one is selected, is like one has won a state lottery jackpot. The Grade VII entry and selection for Grade VIII are shown below. Between 1980 and 1990 the progression rate was on average 21.76%. There was an increase in 1984 from 16.58% to 21.6% due to opening of extra Grade VIII classes in basic schools (these offer Grade I to IX). The same is true for 1989 and 1990 when a lot of basic schools were opened in the eastern and southern regions of the country. In 1993 a total of 993,705 pupils sat the exam. 54,345 pupils were selected into Grade VIII (= 28.05%).

3.10.3 Environmental Science Paper 1994

EXAMINATIONS COUNCIL OF ZAMBIA



PAPER 4
S/TENVSC4/G7/94

ENVIRONMENTAL SCIENCE

TIME: 60 MINUTES

1. Read these instructions carefully.

2. **DO NOT** turn this page before you are told. Your teacher will tell you when to turn this page to begin answering the questions.

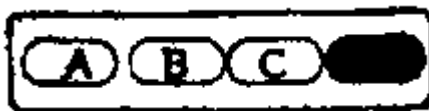
3. There are 50 questions in this **SCIENCE** paper. You will be given **EXACTLY 60 MINUTES** to do the questions.

4. For each question four answers are given, but only one of the four is right. Work out which is the **BEST** answer. Then, on your **ANSWER SHEET** shade the answer space of the letter of your choice in pencil.

EXAMPLE: Malaria, Leprosy and Measles are names of ...

- A. plants.
- B. insects.
- C. minerals.
- D. diseases.

The best answer is D, you would show this answer like this:-



5. You must **SHADE** your answer spaces **COMPLETELY** and **DARKLY WITH A PENCIL**. If you have to change your answer, you must rub out the shading **VERY NEATLY** before shading the new one. **USE A CLEAN RUBBER**.

6. When you have finished one page, go straight on without waiting to be told. If you have time left at the end of the question paper, use it to check your work carefully.

7. Look at your **ANSWER SHEET**. At the top it should have your name, sex, date of birth, examination number, primary school name and name of Secondary School of your choice. It should also say **PAPER 4 ENVIRONMENTAL SCIENCE** on the bottom left side.

8. You will **NOT** be able to ask questions once the examination has begun.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD

USE ONLY A PENCIL FOR YOUR ANSWERS

© E.C.Z. 1994

1. Fish can breathe under water through their ...

- A. scales.
- B. gills.
- C. pores.
- D. noses.

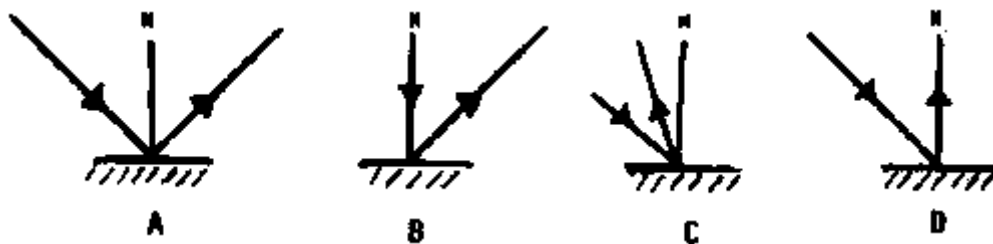
2. Water is put in a basin. It is heated until no more is left. The water has ...

- A. filtered.
- B. dissolved.
- C. evaporated.
- D. melted.

3. During the hot and wet season, which diseases are likely to break out due to unhygienic conditions especially in the villages and townships?

- A. AIDS, T.B., cholera.
 - B. Cholera, typhoid, AIDS.
 - C. Cholera, T.B., AIDS.
 - D. Dysentery, cholera, typhoid.
4. What is the function of white blood cells?
- A. They carry oxygen around the body.
 - B. They carry food around the body.
 - C. They help to get rid of carbon dioxide.
 - D. They kill micro-organisms harmful to the body.
5. Which of these is not an agent of weathering?
- A. Wind.
 - B. Rain.
 - C. Moon.
 - D. Sun.

6. Look at the diagrams on reflection. Which shows the proper reflection of a ray of light on a plane mirror?



7. Many plants which have weak stems climb on other stronger plants. They do this to get more ...
- A. space.
 - B. fresh air.
 - C. sunlight.
 - D. warmth.
8. It is important to leave spaces between the sticks when a fire is laid ready for lighting. This is because ...
- A. fewer sticks are then needed and this saves wood.
 - B. the smoke is made to rise easily.
 - C. the temperature of the flame can be controlled.
 - D. the air between the sticks is needed for burning.
9. Two beakers are filled with the same amount of water and put into two identical heaters. One beaker X is covered with lid while beaker Y is left exposed. Which will boil first and why?
- A. Y because less heat is lost.
 - B. X because heat loss is reduced.
 - C. All because they receive equal heat.
 - D. None because the heat received is little.

10. Study the table carefully.

PLANT	ENERGY GIVING FOOD	BODY BUILDING FOOD	PROTECTIVE FOOD
BEAN	little	plenty	little
MANGO	little	little	plenty
GROUNDNUT	little	plenty	little
PAWPAW	little	little	plenty
IRISH POTATO	plenty	little	little

Using the Table we can say ...

- A. Irish potatoes and groundnuts give us plenty of protective food.
- B. We get plenty of body-building food from beans and groundnuts.
- C. We get plenty of protective food from beans and mangoes.
- D. Pawpaws and mangoes give us plenty of body-building food.

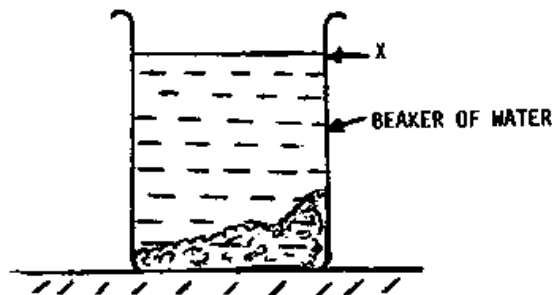
11. Which one of the following statements contains information about friction?

- A. Attraction of a body to the earth.
- B. Property of matter which causes it to be attracted to any piece of matter.
- C. Decreases as the distance from the earth increases.
- D. Offering resistance to movement between surfaces in contact.

12. When Chiko examined a lump of soil she found that it was dark in colour, was not sticky but contained some plant matter. What type of soil was it?

- A. Sandy soil.
- B. Clay soil.
- C. Swampy soil.
- D. Loam soil.

13.



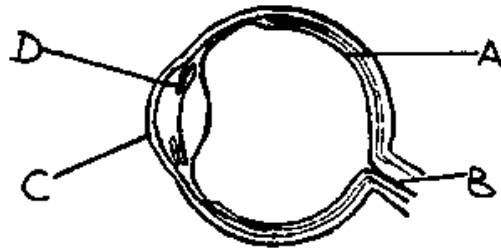
Look at the diagram. Besa dropped a lump of soil into a beaker of water. What did he probably find at X?

- A. Humus.
- B. Stones.
- C. Sand.
- D. Clay.

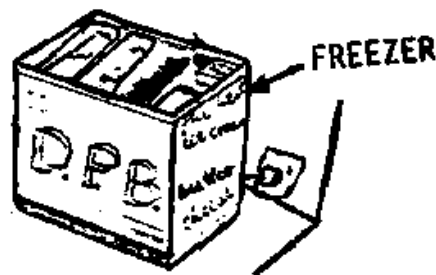
14. Dog belongs to the same group of animals as ...

- A. lizard, fish and whale.
- B. cow, camel and crocodile.
- C. man, cat and bat.
- D. chicken, pig and rat.

15. Look at the diagram of the eye. Which part controls the amount of light getting into the eye?



16. A freezer in a shop does not need a lid. The ice cream or butter inside does not melt because ...



- A. cold air does not rise,
- B. the fridge absorbs radiation.
- C. the fridge is a good conductor.
- D. the shop is freezing.

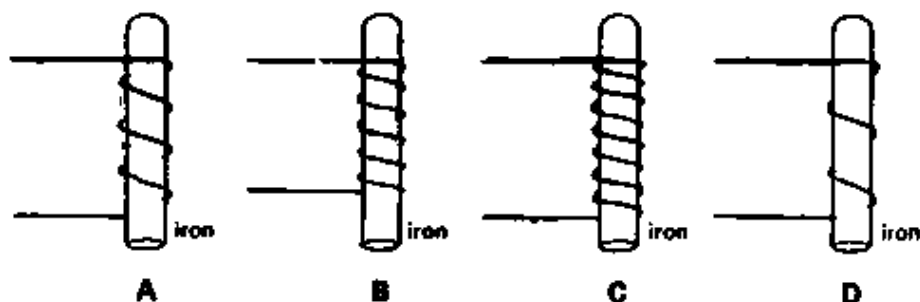
17. People can protect themselves from mosquitoes bites by ...

- A. going to nearest clinic every week.
- B. staying awake the whole night.
- C. spraying floors with oil.
- D. spraying oil on stagnant water.

18. Muleya was asked to separate sugar from a mixture of sugar and sand. Which of the following methods would be the best **way** of doing this?

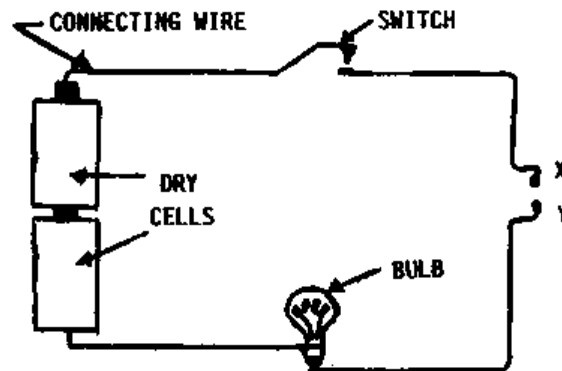
- A. Filtering, evaporating, dissolving.
- B. Dissolving, filtering, evaporating.
- C. Evaporating, filtering, dissolving.
- D. Filtering, dissolving, evaporating.

19. An electro magnet can be considered to be a temporary magnet made from a coil of wire connected to a cell and an iron piece in the centre. Which one of the electro magnets would have the weakest magnetic field?



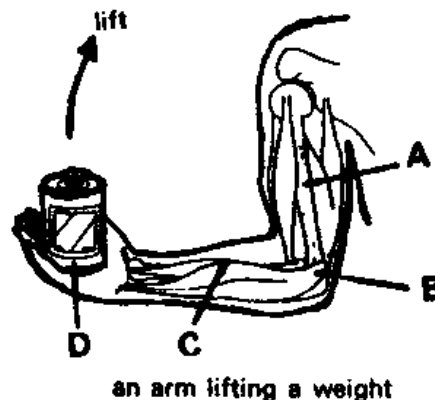
20. Zwange made an electric tester. He tested items by connecting them to X and Y. The results are shown in the table.

Material	light
coin	on
comb	off
chalk	off
knife	on
hair	off
nail	on



The results show that electricity can pass through ...

- A. the coin and nail only.
 - B. the comb, chalk and knife.
 - C. the knife, nail and coin.
 - D. the nail and knife only.
21. A potted plant in the house changed from green to yellowish. What would you do to make the plant green again?
- A. Expose it to more light.
 - B. Put it in the dark.
 - C. Give it more water.
 - D. Give it more fertilizer.
22. Plants make fruits to ...
- A. attract bees.
 - B. feed the leaves.
 - C. enable people to eat them.
 - D. help seed dispersal.
23. Which is a pivot in the drawing?



24. A female frog lays many hundreds of eggs at a time which hatch into tadpoles. What happens to all these tadpoles?

- A. They all grow into frogs.
- B. Many are eaten and only a few grow into frogs.
- C. A few are eaten and many grow into frogs.
- D. All are eaten.

25. What is the main value of compost?

- A. It prevents soil erosion.
- B. It puts valuable plant foods back into the soil.
- C. It prevents the spread of pests and diseases.
- D. It makes it possible for water to enter the soil.

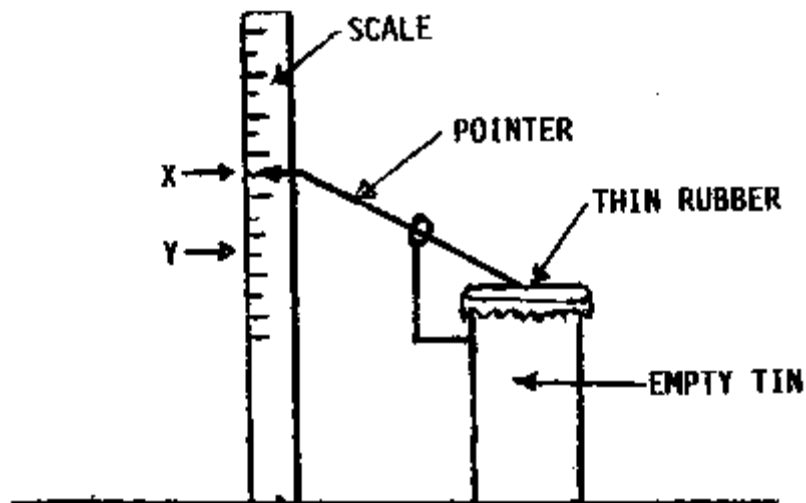
26. Which of these will expand most when heated?

- A. Ice.
- B. Water.
- C. Air.
- D. Rubber.

27. One of the factors that might increase the rate of evaporation of water is

- A. surface area.
- B. volume.
- C. weight.
- D. depth.

28. The diagram below shows a simple barometer prepared by the members of a Science Club. The movement of the pointer in upward and downward directions indicates the weather conditions.



It was observed that the pointer suddenly moved DOWN from X to Y. This indicates that the ...

- A. air pressure has decreased.
- B. air pressure has increased.
- C. temperature of the air has increased.
- D. amount of carbon dioxide in the air has increased.

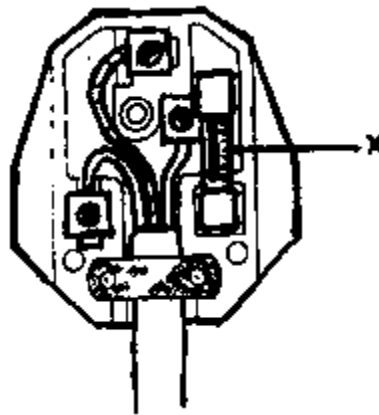
29. In the daytime leaves make use of carbon dioxide to ...

- A. make food for the plant.
- B. make the atmosphere cool.
- C. keep the plant cool.
- D. remove wastes from the plant.

30. A mother wanted to make a balanced meal with MEAT, RICE and CABBAGE. She could not get any cabbage. Which food would she use in the place of cabbage?

- A. Fish.
- B. Pumpkin leaves.
- C. Carrots.
- D. Maize.

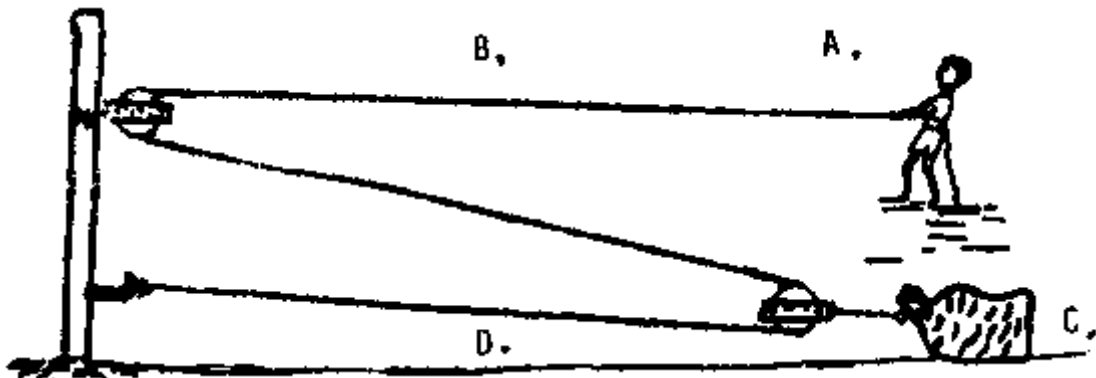
31. Look at the drawing of an electric plug below.



What is the name of the part labelled X?

- A. Fuse.
- B. Earth.
- C. Switch.
- D. Insulator.

32. The rope is pulled by Tobolo. The bag of maize will move towards



33. Before hatching, a bird embryo gets food from ...

- A. seeds.
- B. the yolk.
- C. shell.
- D. chicken's blood.

34. Lungs are like ...

- A. two large empty ballons.
- B. two large ballons filled with blood.
- C. spaces in the body filled with bones.
- D. sponges with lots of very small air pockets.

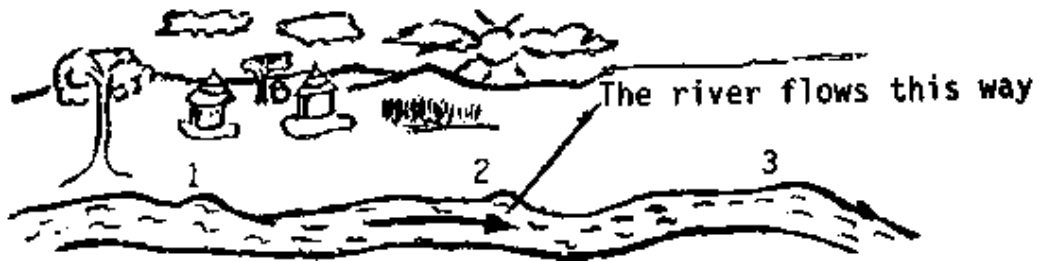
35. What energy change takes place in the pump when a boy is pumping up a bicycle tyre?

- A. Heat-kinetic.
- B. Heat-potential.
- C. Kinetic-potential.
- D. Potential-chemical.

36. A blacksmith makes an iron tyre for a wooden wheel. The iron tyre is just too small to fit over the wheel. To make it fit over the wheel, the blacksmith ...

- A. heats the tyre.
- B. cools the tyre.
- C. heats the wheel.
- D. cools the wheel.

37. This is a picture of a village along a river.



The three places marked are to be used for fetching drinking water, bathing and for animals to drink. Which is the **best** arrangement?

- A. Bathing at 1, fetching drinking water at 2, animals at 3.
- B. Fetching drinking water at 1, animals at 2, bathing at 3.
- C. Animals at 1, bathing at 2, fetching drinking water at 3.
- D. Fetching drinking water at 1, bathing at 2, animals at 3.

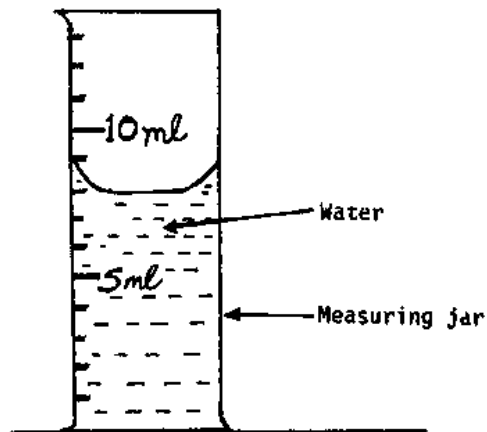
38. A food chain always starts with ...

- A. Man.
- B. Bread.
- C. Plant.
- D. Insect.

39. When Manda first walked into a dark room, he could not see anything until after sometime. This was because ...

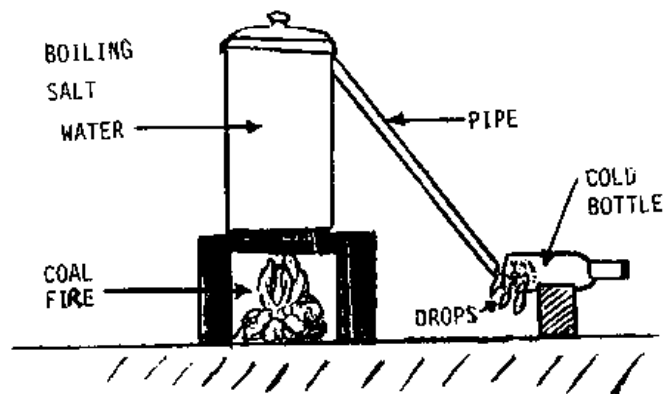
- A. his pupils were too wide.
- B. he was blind.
- C. his pupils were too narrow.
- D. his retina was damaged.

40. Look at this drawing of water in a measuring jar. How much water is in the jar?



- A. 3 ml.
- B. 8 ml.
- C. 9 ml.
- D. 13 ml.

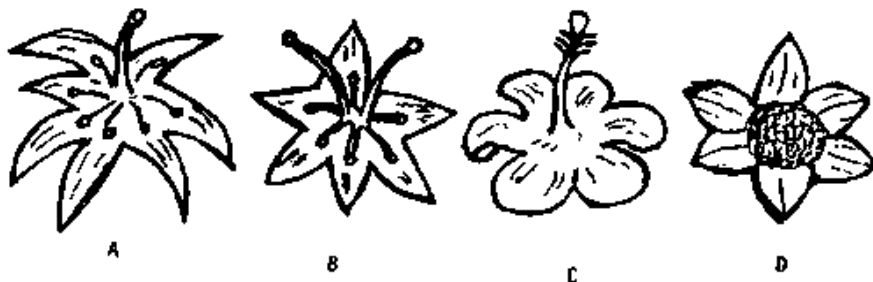
41. Study the diagram carefully.



The water drops formed are ...

- A. very salty.
- B. salty.
- C. not salty.
- D. slightly salty.

42. The teacher gave four pupils a task to do. They had to find a flower with many male parts, 2 female parts and 6 petals. Each pupil came back with a different sort of flower. Which pupil found the right flower?

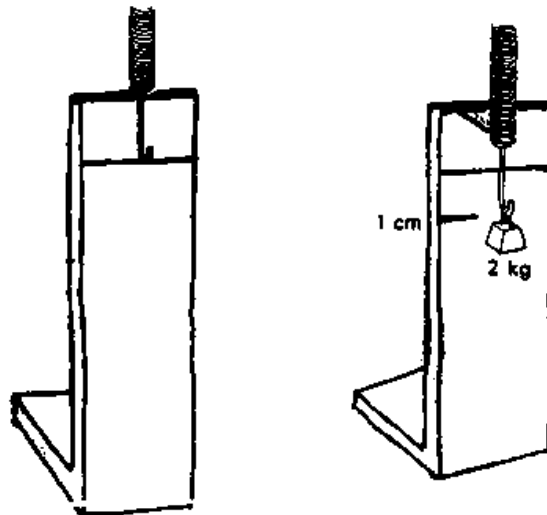


43. Study the diagram carefully. A block of wood is allowed to slide down the ramp. The table shows the angle through which the ramp has to be tilted before the block will slide. Which surface gives the least friction when fixed on the bottom of the wood?



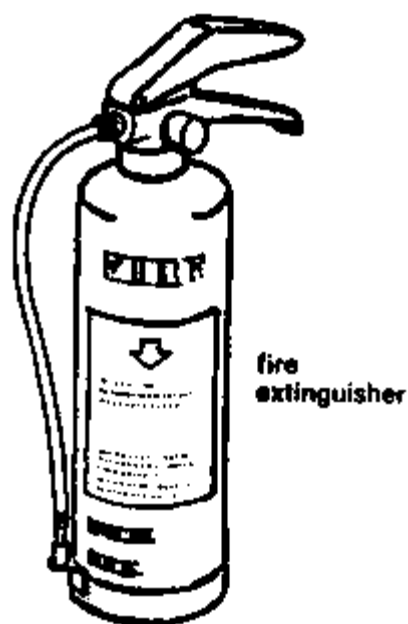
	surface	angle
A	Plastic	15°
B	Cork	22°
C	sandpaper	32°
D	polystyrene	28°

44. Look at the drawings. The length of the spring increases by 1 cm with 2 kg. How much does the length increase with 6 kg?



- A. 2 cm.
 - B. 3 cm.
 - C. 6 cm.
 - D. 12 cm.
45. Nigeria has a lot of oil wells. This oil could have been formed from ...
- A. coal.
 - B. dead plants.
 - C. petrol.
 - D. rocks.
46. The earth was formed from ...
- A. dead animals which were crushed.
 - B. molten material which cooled down.
 - C. large mountains which joined together.
 - D. rocks which were joined together by water.

47. A picture of fire extinguisher is shown. Which set of gases can be in the fire extinguisher?



- A. Oxygen and carbon dioxide.
 - B. Oxygen and nitrogen.
 - C. Carbon dioxide and nitrogen.
 - D. Nitrogen, oxygen and carbon dioxide.
48. Which means of communication has the shortest range?
- A. Drumming.
 - B. Smoke signals.
 - C. Telephone.
 - D. Telex.
49. Before a smoke signal can be sent, what weather conditions must prevail?
- A. Calm, sunny.
 - B. Windy, sunny.
 - C. Cloudy, windy.
 - D. Cloudy, dark.
50. When a gun is fired, sound and light are produced in addition to the bullet, being shot. From what energy are the sound and light produced?
- A. Heat.
 - B. Kinetic.
 - C. Chemical.
 - D. Electrical.

STOP! GO BACK AND CHECK YOUR WORK

3.10.4 Environmental Science Paper 1993

EXAMINATIONS COUNCIL OF ZAMBIA



ENVIRONMENTAL SCIENCE

PAPER 4

TIME: 60 MINUTES

S/SENVSC4/G7/93

1. Read these instructions carefully.
2. DO NOT turn this page before you are told. Your teacher will tell you when to turn this page to begin the questions.
3. There are 50 questions in this SCIENCE paper. You will be given EXACTLY 60 MINUTES to do the questions.
4. For each question four answers are given, but only one of the four is right. Work out which is the BEST answer. Then, on your ANSWER SHEET shade the answer space of the letter of your choice in pencil.

EXAMPLE: Malaria, leprosy and Measles are names of

- A. plants.
- B. insects.
- C. minerals.
- D. diseases.

The best answer is D, you would show this answer like this:-



5. You must SHADE your answer spaces COMPLETELY and DARKLY WITH A PENCIL. If you have to change your answer, you must rub out the shading VERY NEATLY before shading the new one. USE A CLEAN RUBBER.
6. When you have finished one page, go straight on without waiting to be told. If you have time left at the end of the question paper, use it to check your work carefully
7. Look at your ANSWER SHEET. At the top it should have your name, sex, date of birth, examination number, primary school name and name of secondary school of your choice. It

should also say PAPER 4 ENVIRONMENTAL SCIENCE on the bottom left side.

8. You will NOT be able to ask questions once the examination has began.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD

USE ONLY A PENCIL FOR YOUR ANSWERS

© E.C.Z. 1993

1. The germ that causes AIDS can be mostly spread by

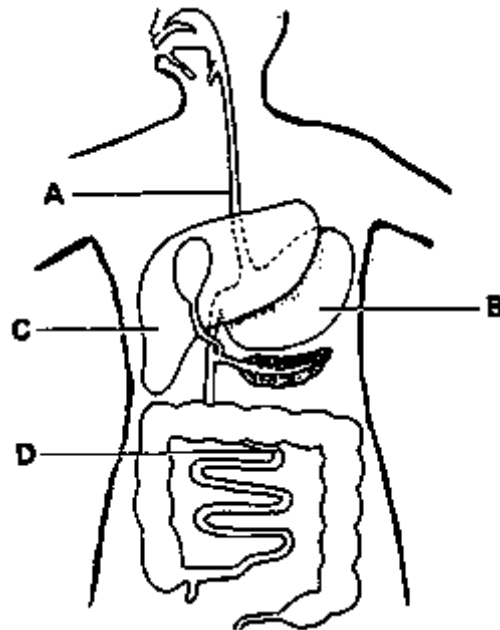
- A. sexual intercourse.
- B. sharing the toilet.
- C. shaking hands.
- D. mosquito bites.

2. A house fly can spread

- A. dysentery, T.B and polio.
- B. dysentery, cholera and typhoid.
- C. dysentery, cholera and TB.
- D. cholera, polio and AIDS.

3. Look at the diagram of the human food canal below.

There are parts labelled A, B, C, and D.



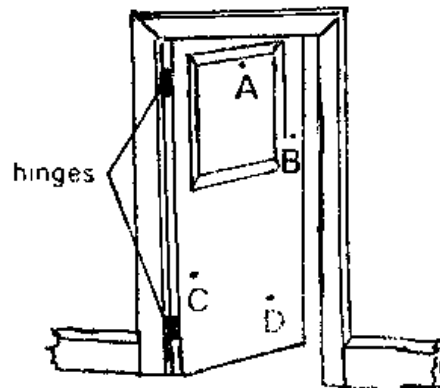
Which part is the liver?

4. At under five clinics infants and young children are immunised against the following diseases:-

- A. AIDS, Cholera, Diarrhoea and Polio.
- B. Polio, TB, Tetanus and Whooping Cough.
- C. AIDS, TB, Cholera and Whooping Cough.
- D. Polio, TB, AIDS and Cholera.

5. You have to push the door to open it.

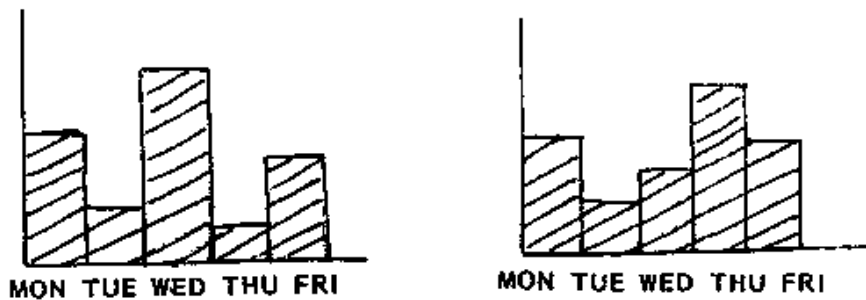
At which point would you use the smallest force?



6. Blowing, over the open end of a cap of a fountain pen creates sound because

- A. air in the cap vibrates.
- B. air outside the cap vibrates.
- C. lips of the person blowing vibrate.
- D. air in the cap stops vibrating.

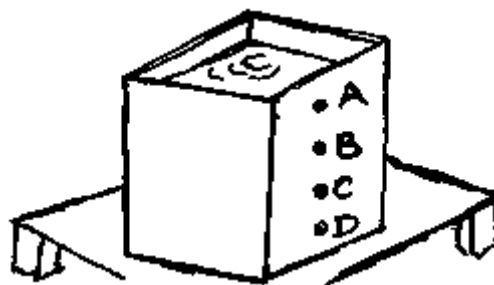
7. Here are two graphs from a school weather record, in the same week



The first one shows the speed of wind. The second shows the temperature. Which statement is right?

- A. The hottest day had the slowest wind.
- B. The hottest day had the fastest wind.
- C. The coldest day had the slowest wind.
- D. The coldest day had the fastest wind.

8. Water is poured into a can that has four holes on its side. From which hole will water come out with greatest force?



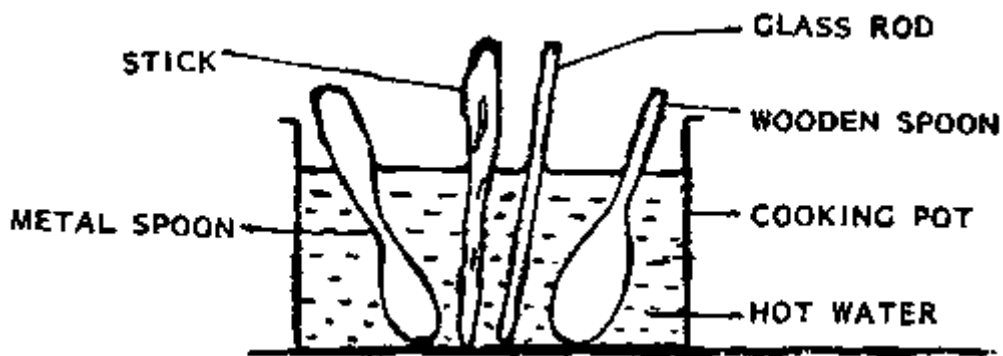
9. Seeds dispersed by wind should be

- A. tiny and hard.
- B. light and feathery.
- C. heavy and feathery.
- D. flat and hard.

10. Some valleys are not suitable for rearing cattle because.....

- A. they are hot.
- B. there is too much water.
- C. they are tsetse fly infested.
- D. there are a lot of wild animals.

11. The diagram shows a cooking pot containing very hot water. There are four things dipping into it.



After ten minutes, which of the following will feel the hottest?

- A. Glass rod.
- B. Stick.
- C. Wooden spoon.
- D. Metal spoon.

12. Weather forecasting is important because

- A. farmers can plan their work.
- B. wind direction can be changed.
- C. rainfall can be changed.
- D. drought will not occur in the country.

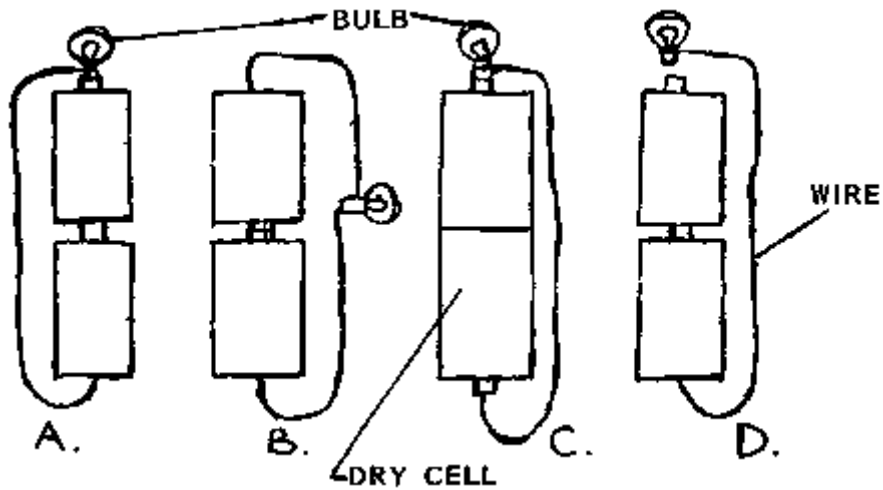
13. Below is a diagram of a telephone system.



What is X?

- A. Mouth Piece.
- B. Ear Piece.
- C. Radio.
- D. Switch Board.

14. Study the four diagrams of electric circuits below. Which one will light?



15. Why should we switch off lights when they are not needed?

- A. To make room cooler,
- B. To help save energy.
- C. To use more charcoal.
- D. To recharge the bulbs.

16. Samples of water were collected from Kafue, Luangwa, Kabompo and Chambeshi rivers. Which sample will show the greatest amount of pollution and why?

- A. Luangwa because it is a fast flowing river.
- B. Kabompo because it flows through a rain forest.
- C. Kafue because it flows through Industrialised areas.
- D. Chambeshi because it flows into Bangweulu Swamps.

17. As the earth goes around the sun it rotates from

- A. east to west.
- B. north to south.
- C. west to east.
- D. south to north.

18. Animal manure is better than artificial fertilizer because

- A. it is cheap and is easy to apply.
- B. it fertilizes the soil as well as improves the soil structure.
- C. it is black and contains plant food in large quantities.
- D. it provides more nitrogen than artificial fertilizers.

19. The property of copper that makes it useful to the world is its ...

- A. bright colour.
- B. softness.
- C. good conductivity.
- D. good insulation.

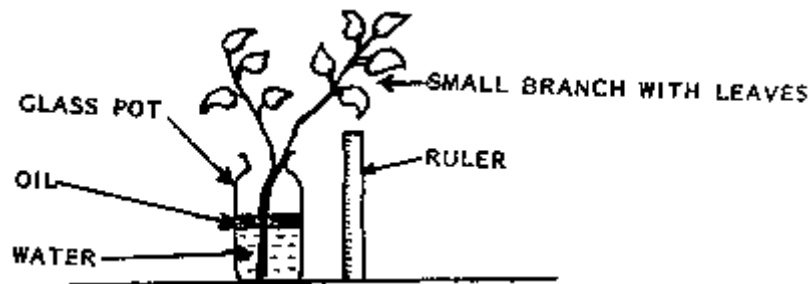
20. Study the diagram below and answer the question that follows.



We can stop soil erosion at X by.....

- A. ploughing across the slope.
- B. ploughing along the slope.
- C. cutting down trees.
- D. burning the area around.

21. A boy sets up an experiment shown in the diagram below. Every twelve hours the boy measures the height of the water in the glass pot.



What is the most likely thing the boy is trying to find out?

- A. Whether oil will kill the plant.
- B. Whether the plant needs carbon dioxide and oxygen,
- C. Whether the plant needs carbon dioxide alone.
- D. Whether the plant uses up water.

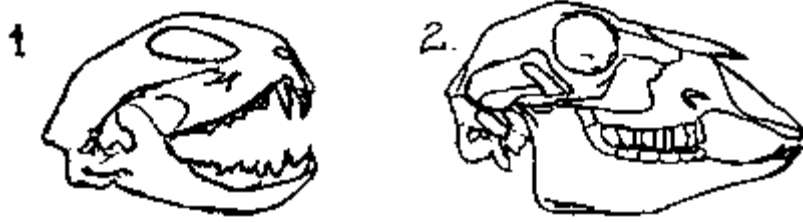
22.



The drawings show the feet of three different birds. Below are four pairs of statements. Pick out the answer where BOTH statements are correct.

- A. Foot 1 is of a bird of prey and foot 3 is of a swimming bird.
- B. Foot 2 is of a perching bird and foot 3 is of Bird of prey.
- C. Foot 3 is of a swimming bird and foot 2 is of a bird of prey.
- D. Foot 1 is of a bird of prey and foot 2 is of a swimming bird.

23. Look at these drawings. They are the jaws of two different animals. Which of the following is true?



- A. Both animals feed on plants only.
- B. Animal 1 feeds on plants and animal 2 feeds on meat.
- C. Animal 1 feeds on meat and animal 2 feeds on plants.
- D. Both animals feed on meat only.

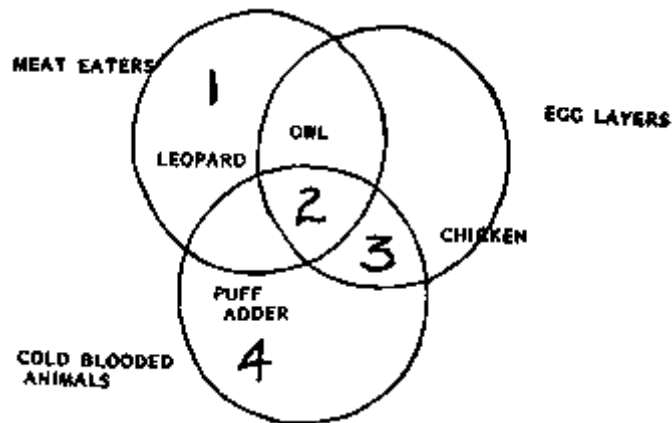
24. A vacuum flask keeps a hot drink warm for a long time because it..

- A. radiates heat out.
- B. reduces the heat escaping.
- C. reduces the light getting out.
- D. keeps warming the drink.

25. Water can exist as

- A. liquid, air and gas.
- B. solid, liquid and gas.
- C. nitrogen, oxygen and water vapour.
- D. oxygen, nitrogen and carbon dioxide.

26.

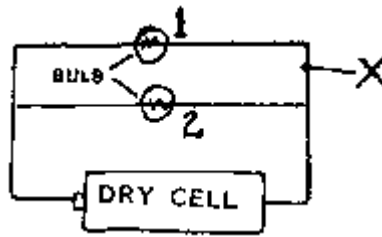


The tortoise is a cold-blooded animal that eats plants and lays eggs. Which number shows its correct position on the diagrams?

- A. 1.
- B. 2.
- C. 3.
- D. 4.

27. Look at the diagram. The wire is broken at X. What happens?

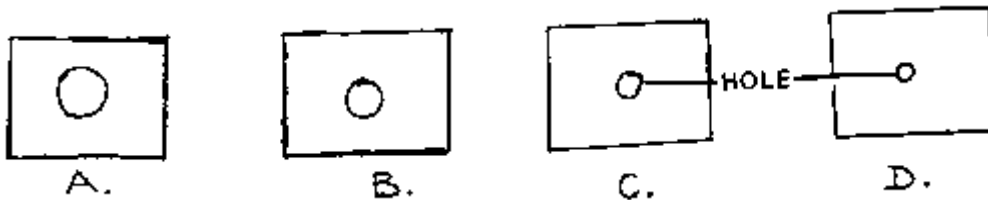
- A. Both bulbs will stay a light,
- B. Only bulb 1 will go out.
- C. Only bulb 2 will go out.
- D. Both bulbs will go out.



28. What energy changes take place when the battery lights up the bulb?

- A. Electrical → Light → chemical.
- B. Light → electrical → potential.
- C. Chemical → electrical → heat and light.
- D. Heat → kinetic → heat and light,

29. The diagrams show different size holes of a camera. Which hole will give the best image if the inside of the pinhole camera is painted black?



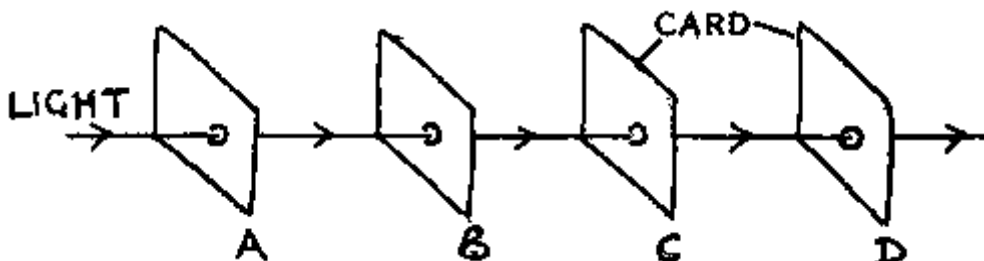
30. The best way to make a piece of steel into a magnet is by:

- A. Stroking a magnet with the piece of steel.
- B. Stroking the piece of steel with a magnet in the same direction.
- C. Stroking the piece of steel with a magnet in different directions
- D. Hitting the piece of steel with a magnet.

31. A boy pulls a box across a table. The friction is most if the table

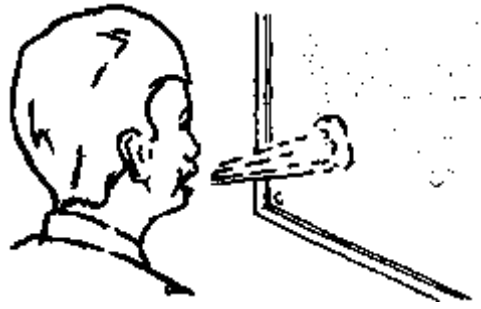
- A. is rough.
- B. is smooth.
- C. has beads on it.
- D. has rollers on it.

32. Look at the diagram. If the hole in CARD C is covered, there will be no light between:



- A. A and B.
- B. B and C.
- C. C and D.
- D. A and D.

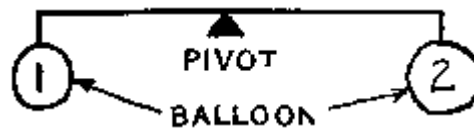
33. In the picture below a boy is shown breathing out in front of a mirror.



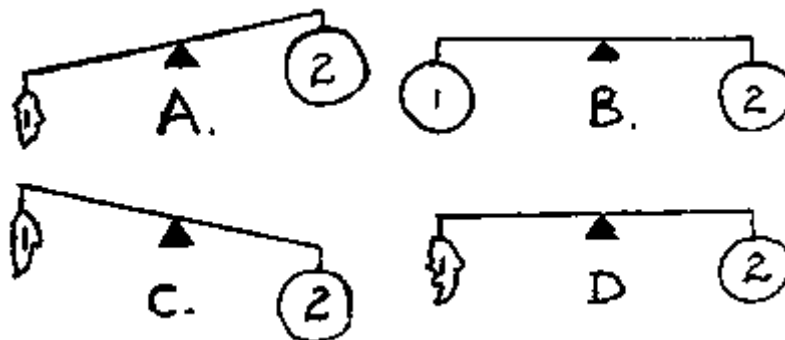
Which change is taking place on the mirror?

- A. melting.
- B. freezing.
- C. evaporation.
- D. condensation.

34. Study the diagram below:



Two balloons 1 and 2 balance horizontally. Balloon 1 is slowly losing air until all the air is lost. Which diagram correctly shows what happened?



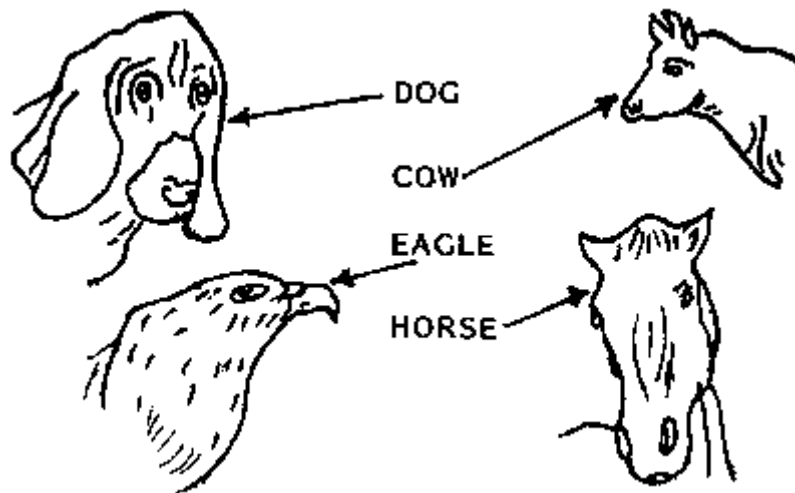
35. Gravity can act only on

- A. large masses on the earth.
- B. all things on the ground.
- C. things around and on the earth.
- D. things at the south and north poles.

36. When a person breathes out during respiration the air contains

- A. more oxygen, less carbon dioxide and more nitrogen than ordinary air.
- B. more nitrogen, less oxygen and more carbon dioxide than ordinary air.
- C. more carbon dioxide, less oxygen and more water vapour than ordinary air.
- D. less nitrogen and oxygen than ordinary air.

37.



Given above is a set of four common animals. Study them carefully.

The DOG is different from the other animals shown because it is the only animal in the set that

- A. eats meat.
- B. suckles its young.
- G. eats meat and suckles its young.
- D. is a domestic animal.

38. An example of an animal which is cold-blooded and has a backbone is a

- A. snail.
- B. snake.
- C. giraffe.
- D. hippo.

39. Look at the drawing of a plant below.



Pollination in this plant is most likely to be carried out by

- A. bees.
- B. wind.
- C. moths.
- D. water.

40. Heat is lost more rapidly by a surface which is

- A. red.
- B. black.
- C. white.
- D. silver.

41. The correct list of gases in ordinary air starting with the most abundant is

- A. oxygen, nitrogen, carbon dioxide.
- B. nitrogen, oxygen, carbon dioxide.
- C. oxygen, carbon dioxide, nitrogen.
- D. carbon dioxide oxygen nitrogen.

42. The string of a guitar can be made to give higher pitch and louder sound by

- A. lengthening the string and plucking it harder.
- B. Shortening the string and plucking it harder.
- C. lengthening the string and plucking it gently.
- D. shortening the string and plucking it gently.

43.

Plants EATEN Animals DIE Microbes.
BY AND
BROKEN
UP BY

In the diagram above, microbes play the part of

- A. producers.
- B. consumers.
- C. decomposers.
- D. parasites.

44. Which of these crops would do better in a drought stricken area?

- A. Maize.
- B. Millet.
- C. Rice.
- D. Potatoes.

45. 30 ml of sand is poured into 30 ml of peas. After mixing, the volume is less than 60 ml.

This is because the grains of sand

- A. melt into the peas,
- B. fit between the peas,
- C. are all the same size,
- D. are harder than the peas.

46. The hinges on a door are oiled. When the door is moved, the friction in the hinges is

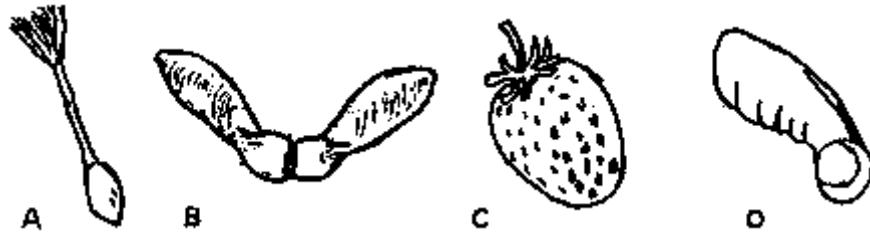
- A. the same,
- B. bigger than before,
- C. smaller than before,
- D. Slightly more than before.



47. Fertilization takes place in plants when

- A. seeds join with fruits,
- B. pollen grains join with ovules,
- C. pollen grains are carried to the stigma,
- D. pollen grains are released from a flower.

48. Look at the drawings below.



Which one is not scattered by wind?

49. Seeds are dispersed so that when young seedlings grow they

- A. can be fertilized.
- B. will be pollinated.
- C. are not overcrowded.
- D. Cannot be eaten by ants.

50. Salt is dissolved in water while stirring continuously until more dissolves. More salt could be dissolved by ...

- A. cooling.
- B. heating.
- C. shaking.
- D. vapourizing.

3.11. Zanzibar

3.11.1. Overview

End of Primary School Examination

1. **Title of examination:** Form 1 Entrance Examination
2. **Amount of fees charged:** Nil
3. **Examination after years in primary school (6, 7, 8 years):** 7 yrs
4. **Children's entry age in primary school:** 7 yrs
5. **Number of pupils sitting examination in 1994:** 7,189
6. **Examination subjects offered:**
 - 9 subjects
 - Science
 - Mathematics
 - Geography
 - History

- Kiswahili
 - English
 - Political Education
 - Arabic
 - Religious Studies
7. **Language of examination:** Kiswahili
8. **Institution setting the examination questions:** Ministry of Education, Dept. of Higher, Science and Technical Education
9. **Have there been any reforms in the examination questions?** Yes
- When? (year)** 1993
- What kind?** Children are in future tested after class 7 of primary school to select some for special secondary schools (Technical Schools, Islamic Schools, Science Schools, French Language School)
10. **Stages of development of examination questions (please describe):**
- Primary school teachers write items in all subjects individually
 - Items reviewed by one moderator (Primary school teachers and school inspectors and exam officers) per subject at national level
 - Moderators set final exam paper
11. **Type of examination questions and distribution of different kind** Straight-forward recall questions only
12. **Is continuous assessment incorporated in the final examination?** Yes []
No [x]
13. **Are examination items pretested?** Yes []
No [x]
14. **Which professional groups are involved in setting the examination questions?**
- Primary school teachers
 - School inspectors
 - Curriculum designers
 - Exam officers of the Ministry of Education
15. **Are the same professionals who set the examination questions involved in marking papers?** Yes [x]
No []
16. **How are examination results used for improving teaching in primary schools?** ./.
17. **To what other uses are the examination results put?** Selection for Secondary School (Form 1) and assessing the general performance of primary schools
18. **Main problem with Primary School Leaving Examinations?**
- Lack of skills and experience in designing test items
 - No facilities for proper data analysis and item banking
 - Lack of skills and experience in item analysis

3.11.2. An Overview of the 1993 Primary School Leaving Examination

by Ministry of Education

Background

Zanzibar consists of two islands - Unguja and Pemba. It provides 10 years of compulsory basic education. At the end of seven years of primary school there is a common examination, called Form 1 Entrance Examination.

Setting of the Examination

All primary schools are individually asked by their respective District Education Officers (DEOs) to set papers according to the level of the National Form 1 Entrance Examination. These papers are brought to the examination office by the DEOs. Each year, 3 to 4 papers from different Districts are given to one experienced primary school teacher for moderation. The paper that has been approved by the moderator is the one that becomes the National Paper (one man moderation).

Administration of the Examination

The examination is normally administered in the month of November each year. A total of 9 subjects are examined at this level and it takes 5 days to administer them.

Supervision of the Exam

The examination is supervised at national level. Most of the supervisors are head teachers or assistant head teachers. Schools in Unguja are supervised by people from Pemba and vice versa.

Invigilation

Invigilation is done at regional level by teachers of different schools. Teachers from one region are sent to another region for invigilation. Teachers from the hosting schools are not permitted to be present in school, unless assigned a special duty.

Despatching of Answer Scripts

Answer scripts are collected at the examination offices everyday. The papers are stored at the office waiting for marking. Since Zanzibar is a small country it is possible to collect all the papers on the same day.

Attendance

In 1993, out of 9,710 registered candidates from 128 primary schools 9,200 (94.75%) sat for the examination. The rest were reported to either have dropped out of the school between the time of registration and the time of examination or to be sick during the examination period.

These pupils are normally allowed to repeat the last year of primary school and re-sit for the National Examination.

Objectives of Zanzibar Primary School Leaving Examination

1. To select few students who will be admitted to Secondary Schools with special biases. From the 1993 examination, 290 (3.2%) candidates were selected to enter 8 secondary institutions with the following specializations:

- 2 Technical Secondary Schools which each take 40 students every year.

- 1 Muslim Academy which takes 40 students every year.

This institution, in addition to the normal secondary school subjects, also teaches Arabic and Islamic Studies.

- 1 French Secondary School which takes 40 students every year.
- 1 Secondary School with the emphasis on Science accommodating 40 students every year.
- 10 students are sent to Tabora Military School in Mainland Tanzania.

Students who are admitted in these Secondary Schools study O-level subjects and sit for the National (Tanzania) O-level Exam. Vacancies in the secondary schools are distributed quarterly to all districts, whereby female students will be considered preferentially to increase their enrollment.

2. To identify repeaters, e.g. candidates who performed poorly.
3. To assess the general performance of the schools, for both teachers and students.
4. To assess the performance of individual students at the end of their primary education.

Results

Out of 9,200 candidates who sat for the Examination, 8,463 (91.9%) were taken to secondary schools. This is because, in Zanzibar we have ten years of compulsory education (8 primary + 2 secondary). However, this system will be changed to 7 plus 3 years, where the 8th year is used as a preparatory year to secondary school. Emphasis at this stage is put on English and Mathematics. Official statistics of the examinations only show the averages of different subjects for different schools. No further statistical analysis is employed, due to lack of skills and resources.

Comments on the Performance

Generally the performance on the 1993 primary education examination was not satisfactory. Pass mark had to be lowered to an average of 20% in order to admit about 90% of the students in Form 1. All schools performed very poorly in all subjects, except in History.

Examination Problems

During the December 1993 »Science Camp« an analysis of the 1993 Science and Mathematics Examination question papers was carried out (»Science Camp« is a research activity project which has been conducted annually during the month of December since 1988).

This research project tries to define efficient methods for the teaching of Science. From the analysis we found out that our examinations consist mainly of straight forward recall questions and ask pupils to reproduce from memory. It was realized that encouraging enquiry, reasoning and problem solving in teaching Science has also to be reflected in the examinations.

It is hoped that in the next years, questions will be included that require problem solving and enquiry based skills.

3.11.3 Form 1 Entrance Examinations 1994 - Science Paper (English Translation)

Candidate's Number

**ZANZIBAR REVOLUTIONARY GOVERNMENT
MINISTRY OF EDUCATION
FORM 1, ENTRANCE EXAMINATIONS, 1994
SCIENCE**

TIME: 1.30 HOURS.

INSTRUCTIONS TO CANDIDATE

ANSWER ALL QUESTIONS IN THIS PAPER

THIS PAPER CONTAINS 8 WRITTEN PAGES

Candidate's Number

CHOOSE THE MOST CORRECT ANSWER AND WRITE THE LETTER IN THE BRACKET PROVIDED.

Example:

The gas that animals use most is

- A. Carbondioxide
- B. Oxygen
- C. Hydrogen
- D. Nitrogen (B)

1. Choose one set of living organisms without a vertebral column among the following set given:

- A. Butterfly, tortoise, bat, mouse.
- B. Snake, millipede, lizard, chameleon
- C. Millipede, snail, cockroach, chameleon
- D. Grasshopper, millipede, butterfly, snail.()

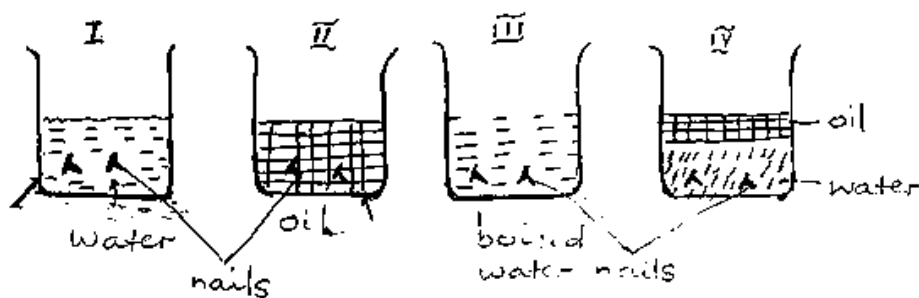
2. What are the necessary needs for the life of animals.

- A. Food, water and medicine
- B. Food, air and medicine
- C. Food, water and air
- D. Protein, starch and oil ()

3. Most insects have 4 stages in their life cycle. The correct sequence is.

- A. Egg, larva, pupa, adult insect.
- B. Larva, egg, pupa, adult insect.
- C. Egg, pupa, Larva, adult insect.
- D. Larva, pupa, egg, adult insect. ()

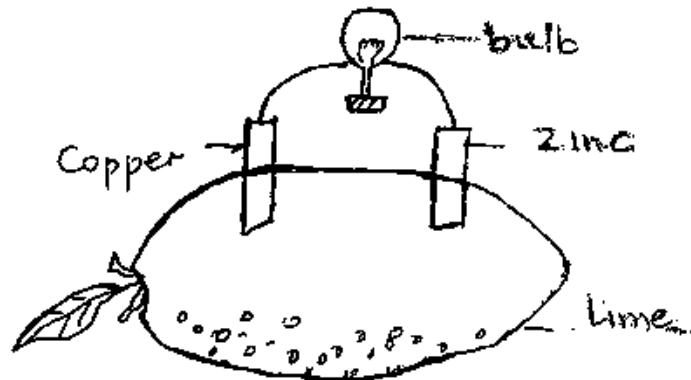
4. Which is the most important difference between animals and plants ?
- Animals moves while plants don't.
 - Animals feed on food while plants don't.
 - Plants manufacture their own food while animals don't.
 - Plants have a short life cycle than animals. ()
5. One among the following is not an excretory organ. Which organ is this ?
- Tongue
 - Skin
 - Lungs.
 - Kidney ()
6. Roots are the most important part of the plant because:
- They hold the branches of the tree.
 - They add the thickness of the stem
 - They make food.
 - They absorb mineral salts from the soil. ()
7. After being measured by the doctor, Khatib, has been found to have a temperature of about 37°C. In Fahrenheit, this is equivalent to
- 37°F
 - 69°F
 - 66.6°F
 - 98.6°F ()
8. Sugar which has dropped in a sauce pan containing water can be separated by using which method ?
- Boiling and evaporation.
 - Filtering the mixture.
 - Decantation.
 - Solidifying the mixture. ()
9. Which among the following set of items are appropriate to use in measuring and recording the height of a growing plant in a shamba?
- Ruler, pencil, book.
 - Ruler, pencil, ink.
 - Notebook, pencil, measuring, scale.
 - Notebook, ruler, and a piece of thread ()
10. Std 8 pupils of Uroa School, did an experiment to find the factors that cause rusting. They did their experiment as shown in diagram I, II, III, IV, below. They left the experiment for one week.



Rusting will occur in

- A. Diagram I only.
 - B. Diagram II and III.
 - C. Diagram II and IV.
 - D. Diagram IV only. ()
11. The density (gm/cm^3) of an object having a mass 2.06 gm and a volume 2.0 cm^3 is
- A. 0.97
 - B. 1.03
 - C. 4.06
 - D. 4.12 ()
12. Which among the following object is a 2nd class lever?.
- A. Human arm
 - B. Crowbar
 - C. Scissors
 - D. Wheel barrow ()
13. One pupil in her experiment has sown some bean seeds in 3 different type of soils - loamy soil, clay and sandy soil. All had equal weight. She waters the plant with equal amount of water at the same time in the morning. In this expt, the student could be able to find.
- A. That water is necessary for seed germination.
 - B. That the amount of water affect growth.
 - C. The type of soil which is good for planting beans.
 - D. The best time for watering bean seedlings. ()
14. Which among the following statements is false?
- A. Electric current is a flow of electron.
 - B. When the guitar strings are tightened, vibrations increase.
 - C. During eclipse of the sun, the earth is found between the sun and the moon.
 - D. Magnetism can pass through the paper. ()
15. Choose among the following example below, that show the correct sequence of a food chain in living organisms.
- A. Plant hen grasshopper cat.
 - B. Plant grasshopper hen cat.
 - C. Cat grasshopper plant hen.
 - D. Hen grasshopper plant cat. ()
16. NPK fertilisers provide plant with the following nutrients except one. Which is this?
- A. Calcium
 - B. Phosphorus
 - C. Potassium
 - D. Nitrogen. ()
17. The load in a rod with one wheel has a weight of 90 Newton, and effort to be used will be 30 Newton. Therefore the mechanical advantage (MA) is
- A. 90
 - B. 30
 - C. 60
 - D. 3 ().

18.







The diagram above shows how lime can be used to produce electricity. Which among the following is the correct sequence that show how energy conversion occur until the bulb gives out light?.

- A. Electric energy chemical energy heat energy light energy.
- B. Chemical energy electric energy heat energy light energy.
- C. Chemical energy heat energy electric energy light energy.
- D. Light energy heat energy Chemical energy light energy. ()

19. Haji can see very well distant objects but has a problem to see near objects, therefore the doctor advices him to wear glasses with:

- A. convex lens
- B. Concave lens.
- C. Thin lens
- D. Flat lens. ()

20. Which among the beaks of the following birds have been correctly matched with the type of food it eats.

- A.  for eating meat.
- B.  for sucking nectar from flowers.
- C.  for eating fish.
- D.  for cracking seeds. ()

SECTION B

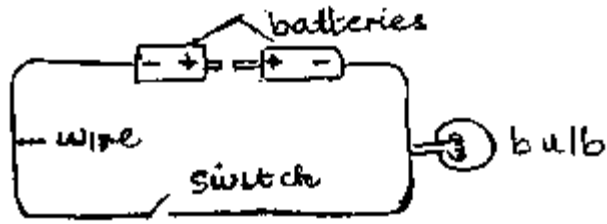
Fill in the correct answer in the blank spaces.

21. Optic Nerve transmit messages to the brain while nerve transmit hearing messages to the brain.

22. Complete the table below.

Vertebrate	Body Covered with	Blood Type	Reproduction by.
Mammal	.....	.....	.....
.....	.....	warm	lay eggs
.....	moist skin	.....	lay eggs
Reptile	scales	.....	.....

23. The diagram of the circuit below does not work. You are required to correct it. Draw the correct diagram.



24. Look at the picture below, then answer the questions that follows.



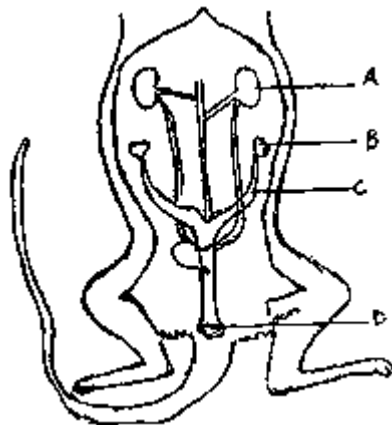
Name two characteristics from the picture that show that the organism is living.

- i)
- ii)

25. Fill in the correct answer in the blank spaces.

- i. Bulb uses energy. This is converted to energy.
- ii. Electric iron uses energy. This is converted to energy.
- iii. Telephone uses energy. This is converted to energy.
- iv. Television uses energy. This is converted to energy.

26.



The diagram above shows the reproductive system of a female mouse. Write the name of parts labelled with letter.

- A.
- B.
- C.
- D.

3.11.4 Form 1 Entrance Examinations 1993 - Science Paper (English Translation)

S.M.Z

MINISTRY OF EDUCATION, ZANZIBAR.

FORM ONE ENTRANCE EXAMINATIONS, 1993.

SCIENCE

TIME: 1 HOUR 30 MINUTES.

INSTRUCTIONS.

ANSWER ALL THE QUESTIONS IN THIS PAPER.

THIS PAPER CONSISTS OF 3 PRINTED PAGES.

SECTION A.

CHOOSE THE CORRECT ANSWER AND WRITE ITS LETTER ON THE BLANK SPACES.

1. Blood is made up of

- A. White blood corpuscles and protein.
- B. Plasma, red blood corpuscles and white blood corpuscles.
- C. Water and salts.

2. Objects that allow electricity to flow are called

- A. Insulator
- B. Galvanometer
- C. Conductor

3. Bat is an animal that belong to the group

- A. Mammals
- B. Birds
- C. Reptiles

4. Matter is made up of

- A. Electrons
- B. Protons
- C. Atoms

5. Amoeba and paramecium are organisms which belong to a group

- A. Protozoa
- B. Reptiles
- C. Amphibian

SECTION B.

FILL IN THE BLANK SPACES.

1. The two types of skeletons are skeleton and skeleton.
2. Rusting can be prevented by

3. Generator produce direct current
4. Skin is made up of parts, which are and
5. Food in an animal pass through the

SECTION C.

ANSWER THE FOLLOWING QUESTIONS.

1. Mention the five sense organs in living organism.

.....

2. Briefly explain the meaning of balanced diet.

.....

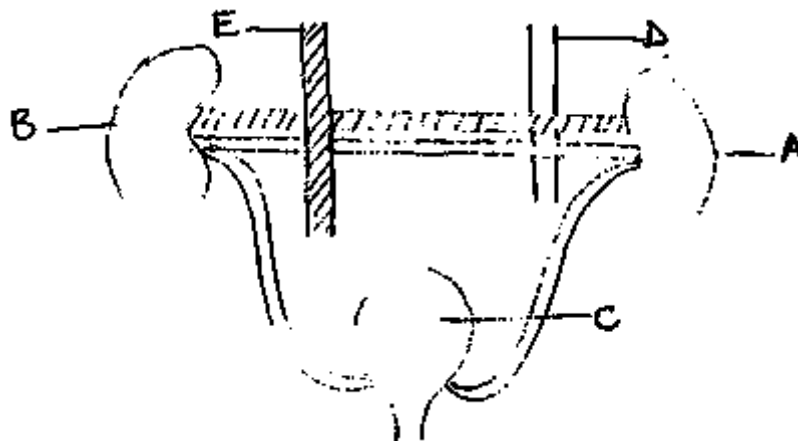
3. Draw

(a) a short sighted eye.

(b) a diagram of a lens to show how short sighted is corrected.

4. With an aid of a diagram, briefly explain how to make a transformer.

5. Label the parts indicated with letters.



3.12. Zimbabwe

3.12.1. Overview

End of Primary School Examination

1. **Title of examination:** Grade 7 Examination
2. **Amount of fees charged:** Nil
3. **Examination after years in primary school (6, 7, 8 years):** 7 yrs
4. **Children's entry age in primary school:** 5 1/2-6 yrs
5. **Number of pupils sitting examination in 1994:** 306,706
6. **Examination subjects offered:**
 - 6 subjects in 4 papers:
 - Shona or Ndebele
 - Mathematics
 - English
 - General Paper (Religious & Moral Education/Social Studies, Science & Agriculture)
7. **Language of examination:** English (except for African languages)
8. **Institution setting the examination questions:** Examinations Branch, Ministry of Education and Culture
9. **Have there been any reforms in the examination questions?** Yes
 - When? (year)** 1990
 - What kind?** General Paper (consisting of items from Social Studies, Science and Agriculture, Religious and Moral Education) and African languages (Shona or Ndebele) were introduced in the Grade 7 Examinations.
10. **Stages of development of examination questions (please describe):**
 - Items are generated by regional panels and Curriculum Development Unit. Items are moderated at regional panel meetings and selected for presentation at National Panel (teachers are involved).
 - National Panel consisting of representatives from regional panels moderate items submitted by regional panels and select them for constructing papers to be presented.
 - National Panel selects items that have been pre-tested for final examinations.

11. **Type of examination questions and distribution of different kind of questions.** Multiple-choice items only:
30% knowledge
40% comprehension
20% application
10% problem solving
12. **Is continuous assessment incorporated in the final examination?** Yes []
No [x]
13. **Are examination items pretested?** Yes [x]
No []
14. **Which professional groups are involved in setting the examination questions?**
- Primary school teachers
 - School inspectors
 - Curriculum developers in Curriculum Development Unit (CDU)
 - Examination specialists
15. **Are the same professionals who set the examination questions involved in marking papers?** Yes []
No [x]
- If no, who marks the papers (state)?** Marked by optical mark reader/computer.
16. **How are examination results used for improving teaching in primary schools?**
- Examination papers that have been written by candidates remain in the school for future use of teachers or pupils.
 - Reports on performance of candidates in an examination are circulated to schools.
17. **To what other uses are the examination results put?** Evaluation of primary school system for national government and relevant section of Ministry of Education, e.g. district education offices.
18. **Main problem with Primary**
- Items have tended to test recall at the expense of other mental skills.
 - Pupils may not take them seriously where the examinations are not used for selection.
 - Because of large candidature multiple-choice tests only are administered. Skills that are not well measured by such questions are therefore not measured in the primary examination.

3.12.2. Analysis of End of Primary Education Examination in Zimbabwe

by Nelson Muzambi, Examinations Branch, Ministry of Education

1. The duration of primary education in Zimbabwe is 7 years. Assessment of pupils from Grade 1 (year 1) to Grade 6 (year 6) is entirely school-based, with each school being responsible for producing end-of-term and end-of-year reports for each pupil.
2. The Grade 7 Examinations, the end of primary education examinations, are set by the Examinations Branch. Authority for setting, moderating, administering, marking and awarding is vested in the Secretary for Education and Culture, with the Examinations Branch as the executing body.
3. The purpose of the examination is to certify that pupils have completed seven years of

primary education and to record levels of individual pupil competency in four subject areas. The examination is not used as a selection tool because promotion is automatic to the next grade. The outcome of automatic promotion is that many pupils who proceed to their first year of secondary education (form 1) do not have the skills to function at that education level.

4. Pupils in Grade 7 take four tests: English, Mathematics, an African language (Shona or Ndebele) and a General Paper. The General Paper comprises items from Environmental Science, Social Studies and Religious and Moral Education syllabi. All the tests are written in English with the exception of the African languages. Each subject test (examination) is composed of one paper of 50 multiple-choice questions. Pupils are allowed two hours per paper.

5. The multiple-choice questions are written by nine regional panels, consisting of experienced teachers and education officers (supervisors). Each region is responsible for selecting a certain number of items but with little guidance from the Examinations Branch.

6. Each regional panel is represented at national subject panel meetings arranged by the Examinations Branch. At these meetings, questions for the final examination papers and pre-test papers are selected, based on a set of skill assessment objectives.

7. All final examination questions have to be pretested before they are administered to the candidates. Computerised item analysis is done on an old system which determines each item's discrimination index, facility index and P-value. Items that perform well in pretests are the only ones that are selected for the final papers to ensure that the final product suits the broad spectrum of candidates in the schools. Multiple-choice tests were introduced in the Grade 7 Examination in 1984. The reaction from parents and other concerned parties was mixed, with a significant number criticizing the tests because they thought they lacked validity and could be done by »idiots«.

8. The Government printer in Harare prints each year's examinations in one colour on newsprint. The Examinations Branch distributes the examination papers via the postal service to each of the 5,800 schools nationwide. Teachers administer each subject as stipulated on the examinations timetable. The teachers are not given training in test administration or security. Used examination papers are left at the schools for use by both teachers and pupils.

9. Scanner sheets completed by the candidates are marked by optical mark readers. The Branch currently produces score reports from the data tape on an old processing system. The score reports consist of the certificates given to each pupil who completes the test. The certificate lists a grade of 1-9 for each subject convertible into a 'percentage equivalent' according to a scale printed on the back of the certificate. A grade 1-6 represents a pass. Scores are not compared between groups such as schools or regions.

10. A comprehensive report on the Grade 7 Examination is written at the end of each year. The information in the report is meant to help Grade 5-7 teachers improve teaching of the various subjects. The report includes statistics on pass rate and comments on the performance of candidates in the separate subjects.

3.12.3. Examination Problems Encountered

by Margareter Chirongoma, Examinations Branch, Ministry of Education

1. There is general lack of expertise in the multiple-choice item construction.

2. There is need to produce more comprehensive reports on the Grade 7 Examination for every subject pointing out the strengths and weaknesses of the items. This would go a long way to assist the teachers to improve their ability to develop items for school based assessment.

3. As for the General Paper 50 items are not enough to effectively test four subjects, namely,

- Social Studies
- Environmental Science (incl. Agriculture)
- Religious and Moral Education
- Home Economics.

In the »General Paper« Science and Agriculture are examined from question 31-50, which is only 20 items. So it is almost impossible to give a good coverage of the syllabus. Therefore there is need to test each subject separately as has been suggested by teachers who completed the questionnaire sent out to schools to evaluate the 1993 Grade 7 Examinations.

4. Scores from continuous assessment do not contribute to the final grade such that the grade one acquires in the national examination may not be a true reflection of one's performance.

5. Language development is hindered since the objective tests do not promote free expression.

Printed by the Government Printer, Harare

3.12.4 Grade 7 Examination 1994 - General Paper (Science and Agriculture)

MINISTRY OF EDUCATION AND CULTURE ZIMBABWE

GRADE SEVEN EXAMINATION, 1994 GENERAL PAPER

Date: Wednesday, 19 October 1994 Time: 2 hours

INSTRUCTIONS TO CANDIDATES

1. Read ALL the instructions carefully.
2. DO NOT open this booklet until you are told to do so by the invigilator.
3. Use ONLY a 2HB pencil for all entries on the answer sheet.
4. If you wish to change your answer, ERASE it COMPLETELY with a pencil rubber and then shade the new choice.
5. If MORE than ONE circle is shaded for any one answer, that answer will be regarded as WRONG.
6. When you are told to start, choose ONE correct answer from the suggested answers and shade it VERY DARK.
7. If you DO NOT understand the instructions ask the invigilator to explain them to you BEFORE you start.
8. Answer ALL the questions on the separate answer sheet provided.

This question paper comprises 18 printed pages.

Copyright. Ministry of Education and Culture. 1994

Questions 1-30 refer to Religious and Moral Education and Social Studies.

Use figure 1 to answer question 31.

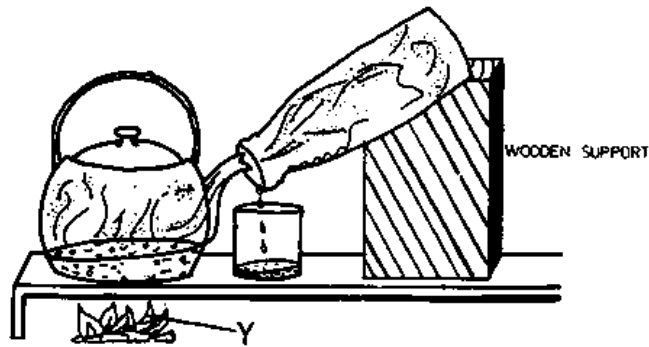


Figure 1

31. What is produced at Y that causes the water to boil?

- A. Heat.
- B. Light.
- C. Smoke.
- D. Steam.
- E. vapour.

32. Which of the following is a water-borne disease?

- A. Cold.
- B. Dysentery.
- C. Malaria.
- D. Measles.
- E. Tetanus.

Use figure 2 to answer question 33.

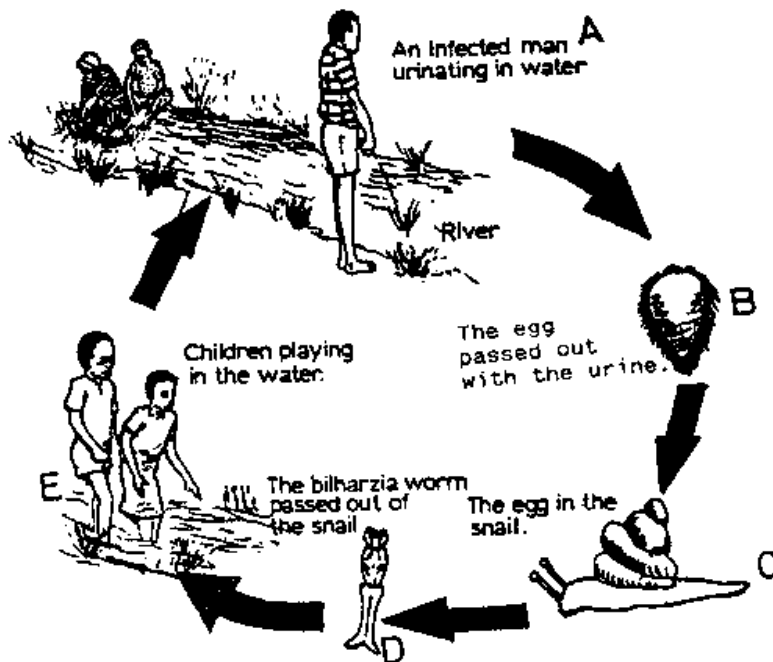


Figure 2

33. At which point of the bilharzia cycle A, B, C, D or E does the bilharzia parasite enter the body?

Use figure 3 to answer question 34.

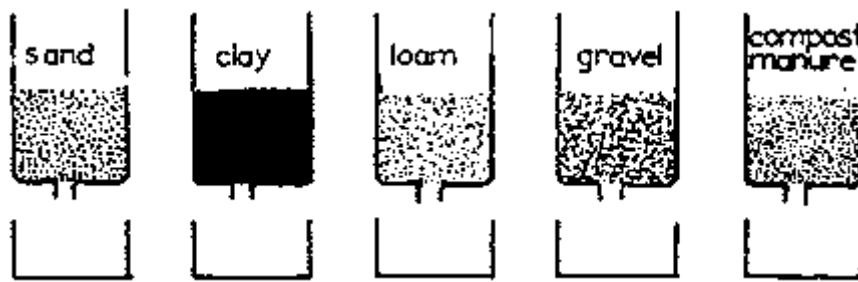


Figure 3

34. Equal volumes of water are poured into equal volumes of different kinds of substances. After a set time, which substance will have allowed the least amount of water to go through?

- A. Clay.
- B. Gravel.
- C. Loam.
- D. Manure.
- E. Sand.

Use figure 4 to answer question 35.

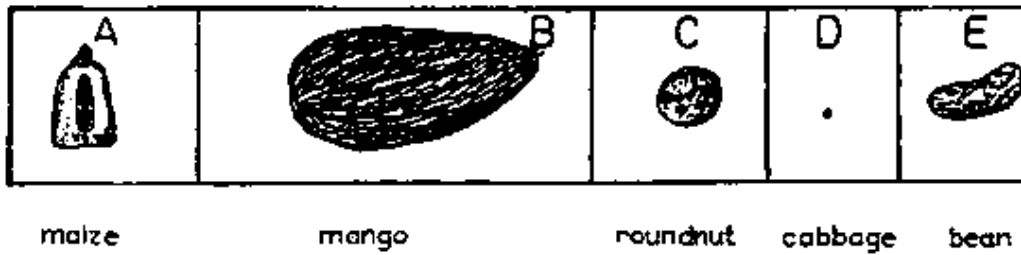


Figure 4

35. Which seed is likely to germinate last under the same conditions?

Use figure 5 to answer question 36.

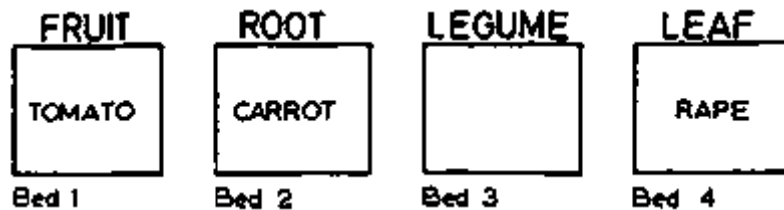


Figure 5

36. This diagram shows a four year crop rotation for a garden. In this rotation which crop would be in bed 3?

- A. Beans.
- B. Cabbage.
- C. Lettuce.
- D. Onion.
- E. Spinach.

37. Which weather condition is best for transplanting seedlings.

- A. Cool and dry.
- B. Hot and humid.
- C. Cloudy and damp.
- D. Dry and calm.
- E. Windy and dry.

38. To which plant family do maize, rice and wheat belong?

- A. Grass.
- B. Fruit.
- C. Legume.
- D. Tuber.
- E. Vegetables.

39. Green plants need the following to make food and grow

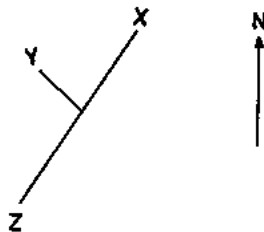
- A. Bees, sunlight and air.
- B. Soil, worms and water.
- C. Sunlight, air and water.
- D. Manure, air and sunlight.
- E. Clay, water and air.

40. Mulching helps the soil to

- A. lose a lot of water.
- B. shelter the roots.
- C. keep moisture for a longer period.
- D. lose water at a faster rate.
- E. become water-logged.

Use figure 6 to answer question 41.

Figure 6



41. The direction of X from Y is

- A. North.
- B. North East.
- C. North West.
- D. South.
- E. South West.

42. If a transparent plastic bag is tied over some leaves of a living plant what will be seen in the plastic bag after several hours?

- A. Air.
- B. Dry leaves.
- C. Insects.
- D. No change.
- E. Water drops.

Use figure 7 to answer question 43.

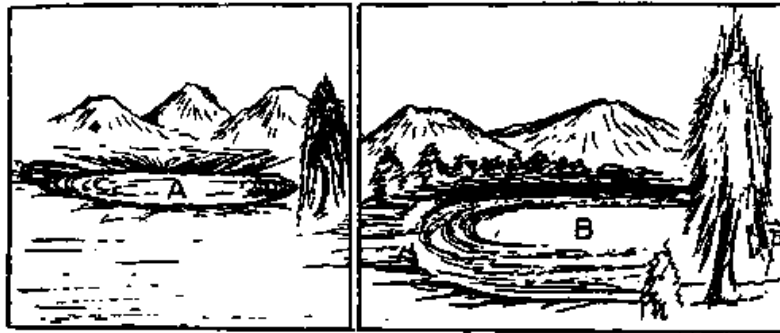


Figure 7

43. Pools A and B are in the same area. They have equal amounts of water. Why does pool B lose more water by evaporation than pool A?

Because pool B

- A. has strong winds over it.
- B. is in a very dry place.
- C. stores much more water.
- D. is not sheltered by the hills.
- E. has a bigger surface area.

44. What type of fuel do steam engines use?

- A. Coal.
- B. Diesel.
- C. Electricity.
- D. Paraffin.
- E. Petrol.

The diagrams in figure 8 show simple electric circuits.

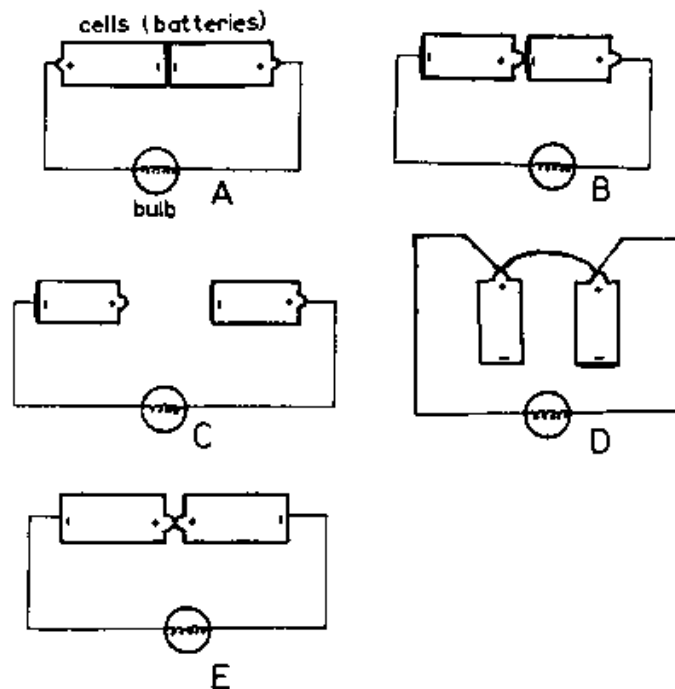


Figure 8

45. Which bulb will light up?

Use figure 9 to answer question 46.

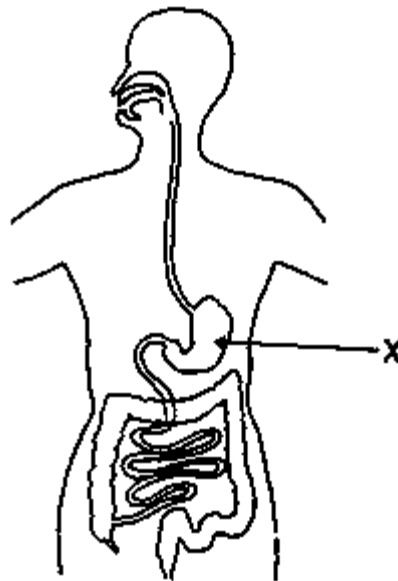


Figure 9

46. Name the part labelled X.

- A. Heart.
- B. Intestines.
- C. Liver.
- D. Lungs.
- E. Stomach.

Use the map of Zimbabwe in figure 10 to answer the question that follows.

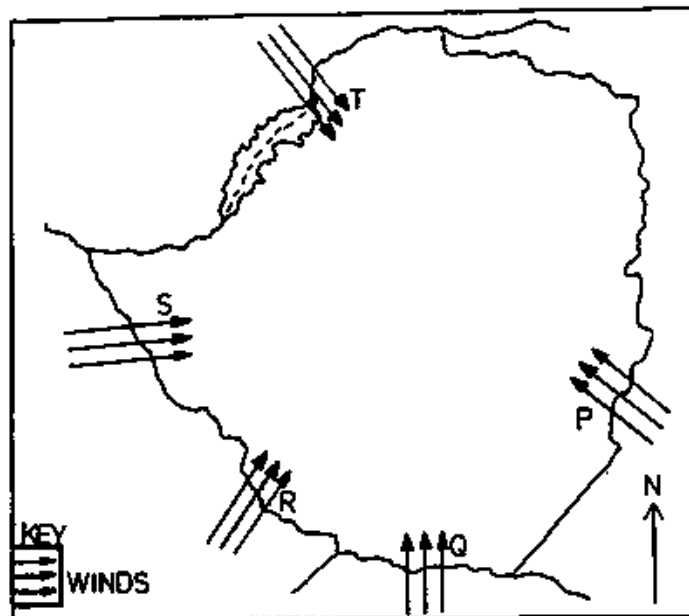


Figure 10

47. Which of the winds P, Q, R, S or T bring most rains to Zimbabwe when they meet:

- A. T and S.
- B. R and S.
- C. R and Q.
- D. R and T.
- E. P and T.

48. Use figure 11 to answer question 48.

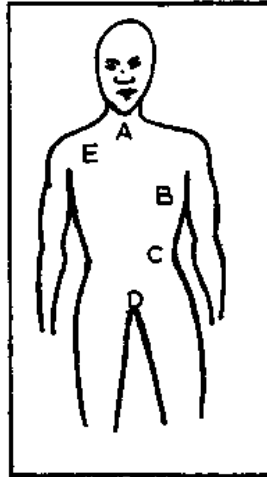


Figure 11

48. Which letter shows the position of the heart.

49. What should people do to make unprotected water safe for drinking?

- A. Boil it.
- B. Add salt.
- C. Keep it cool.
- D. Let it settle.
- E. Sieve it.

Use figure 12 to answer question 50.



Figure 12

50. The winds of the area shown are mostly coming from the east. The set up of the home is wrong because the

- A. living huts are far from the toilet.
- B. protected well is not supposed to be between the huts and toilet.
- C. smell from the toilet is continuously blown to the huts.
- D. toilet water will flow to the well.
- E. toilet should be nearer to the well.

3.12.5 Grade 7 Examination 1993 - General Paper (Science and Agriculture)

**MINISTRY OF EDUCATION AND CULTURE
ZIMBABWE**

**GRADE SEVEN EXAMINATION, 1993
GENERAL PAPER**

Date: Wednesday, 20 October 1993 Time: 2 hours

INSTRUCTIONS TO CANDIDATES

1. Read **ALL** the instructions carefully.
2. **DO NOT** open this booklet until you are told to do so by the invigilator.
3. Use **ONLY** a pencil for all entries on the answer sheet.
4. If you wish to change your answer, **ERASE** it **COMPLETELY** with a pencil rubber and then shade the new choice.
5. If **MORE** than **ONE** circle is shaded for any one answer, that answer will be regarded as **WRONG**.
6. When you are told to start, choose **ONE** correct answer from the suggested answers and shade it **VERY DARK**.
7. If you **DO NOT** understand the instructions ask the invigilator to explain them to you **BEFORE** you start.
8. Answer **ALL** the questions on the separate answer sheet provided.

This paper comprises 13 printed pages.

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Questions 1-30 refer to Religious and Moral Education and Social Studies.

Use figure 1 to answer question 31.

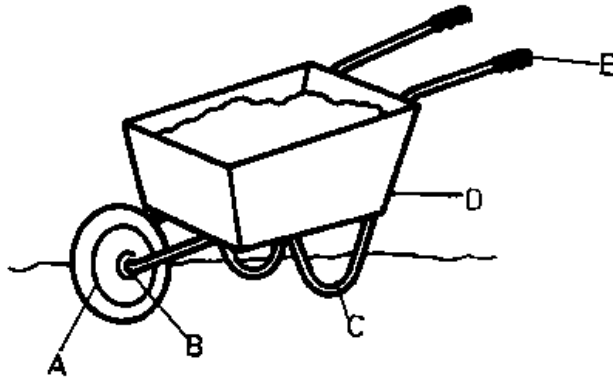


Figure 1

31. Which part of the wheelbarrow has to be greased in order to reduce friction?

32. Bilharzia parasites live in one of the following creatures,

- A. water spiders.
- B. water worms.
- C. water slugs.
- D. water snails.
- E. water scorpions.

33. The shape of the earth is

- A. a circle.
- B. an oblong.
- C. a sphere.
- D. a trapezium.
- E. flat.

34. The sun's energy is called

- A. chemical.
- B. electrical.
- C. hydro-electric.
- D. thermal.
- E. solar.

35. People are scared of AIDS because

- A. the disease has no cure.
- B. the disease cannot be easily cured.
- C. the disease is foreign to Zimbabwe.
- D. doctors fear to touch patients with it.
- E. it kills only young people.

36. Which crop gives most proteins?

- A. Maize.
- B. Soya beans.
- C. Sorghum.
- D. Wheat.
- E. Millet.

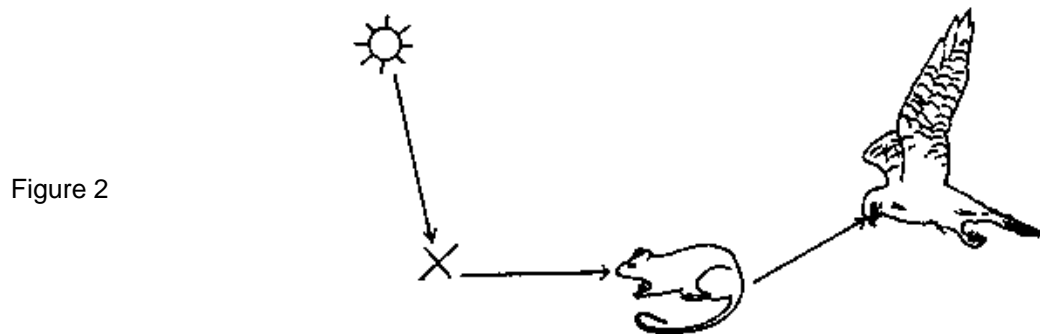
37. The low land between mountains or hills is called a

- A. field.
- B. forest.
- C. plateau.
- D. slope.
- E. valley.

38. Animals that eat other animals are called

- A. browsers.
- B. carnivores.
- C. grazers.
- D. herbivores.
- E. insect eaters.

Use Figure 2 to answer question 39.



39. What part of food chain represented by X is missing?

- A. Air.
- B. Carnivore's.
- C. Plants.
- D. Soil.
- E. Water.

40. If you are outside and there is lightning what must you do to protect yourself?

- A. Stand very still.
- B. Shelter under a tree.
- C. Run away fast.
- D. Crouch down.
- E. Don't have enemies.

41. A class recorded the number of boxes of tomatoes it sold for three days per week for three weeks. The following is their recording.

DAY	WEEK 1	WEEK 2	WEEK 3
MONDAY	|||| |	|||| |||	||||
WEDNESDAY	||| |	||| ||	||| |||
FRIDAY	|||| ||| |||	|||| ||| |||	||| ||| ||

If the class wanted to sell the most tomatoes which two days should they choose?

- A. Wednesday and Friday.
- B. Tuesday and Thursday.
- C. Monday and Thursday.
- D. Monday and Friday.
- E. Wednesday and Monday.

42. Which of these is man-made?

- A. Cotton.
- B. Linen.
- C. Nylon.
- D. Silk.
- E. Wool.

43. What do green plants use to make plant food?

- A. Air, food, sunlight.
- B. Food, roots, water.
- C. Roots, sunlight, air.
- D. Soil, air, sunlight.
- E. Water, sunlight, air.

44. What must be done with empty pesticide containers?

- A. Clean them.
- B. Destroy them.
- C. Store food in them.
- D. Store water in them.
- E. Sell them to others.

45. It is good to grow plants in fish ponds because

- A. fish like small water plants in a pond.
- B. of some fish in the pond.
- C. oxygen given off by plants is used by the fish.
- D. the green colour of the plants attracts fish in the pond.
- E. the plants help the fish to swim.

Use figure 3 to answer question 46.



Figure 3

46. The skull is likely to be that of an animal that fed on

- A. other animals.
- B. tree leaves.
- C. house flies.
- D. earth worms.
- E. tall grass.

Use figure 4 to answer question 47.

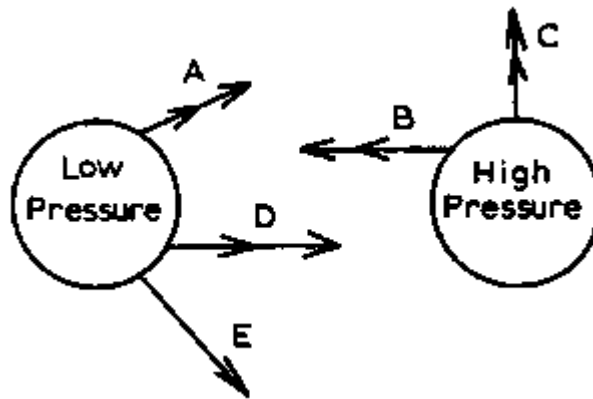


Figure 4

47. Which arrow shows the direction the wind will blow to?

Use figure 5 to answer question 48.

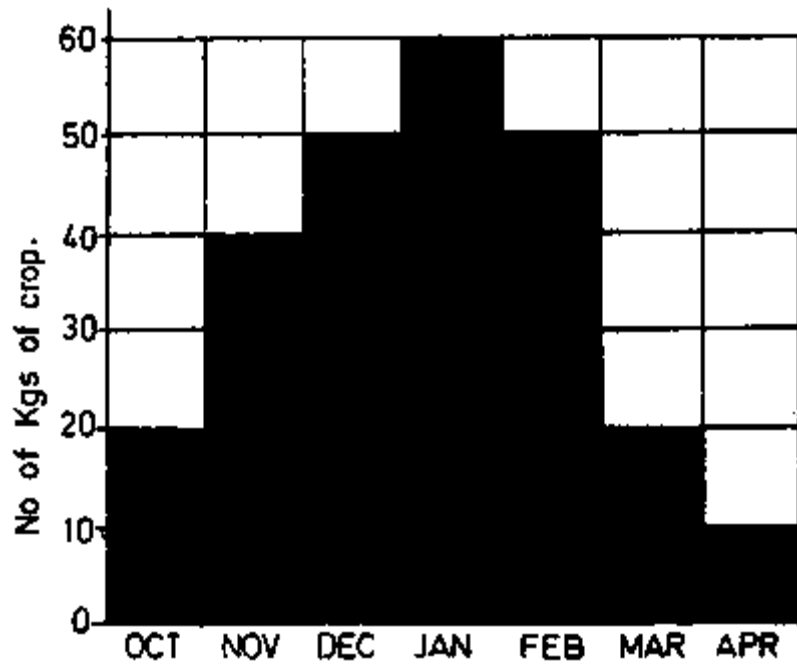


Figure 5

48. The graph shows the number of kilograms of a crop harvested. Choose a statement true of the graph.

- A. The largest harvest was in February.
- B. 20Kg of crop was harvested in April.
- C. The second largest harvest was in January.
- D. The largest harvest was in January.
- E. November had the largest harvest.

Use figure 6 to answer question 49.

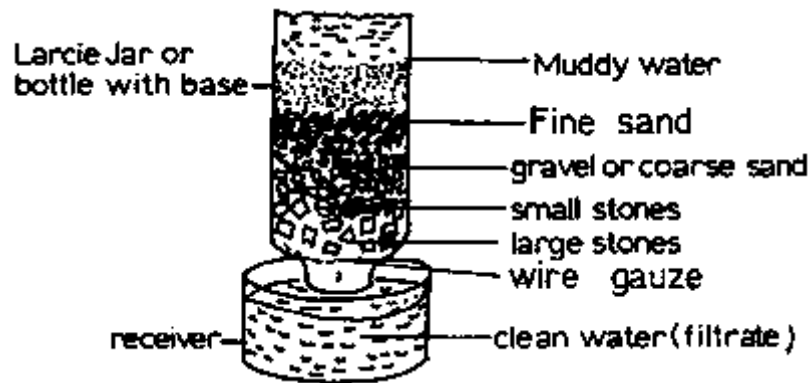


Figure 6

49. During filtration of water, fine sand is put in the filter because it

- A. does not allow the dirt particles to pass through.
- B. holds the larger pebbles and stones.
- C. helps water run easily.
- D. is not washed away by the water.
- E. takes away salt from the water.

Use Figure 7 to answer question 50.

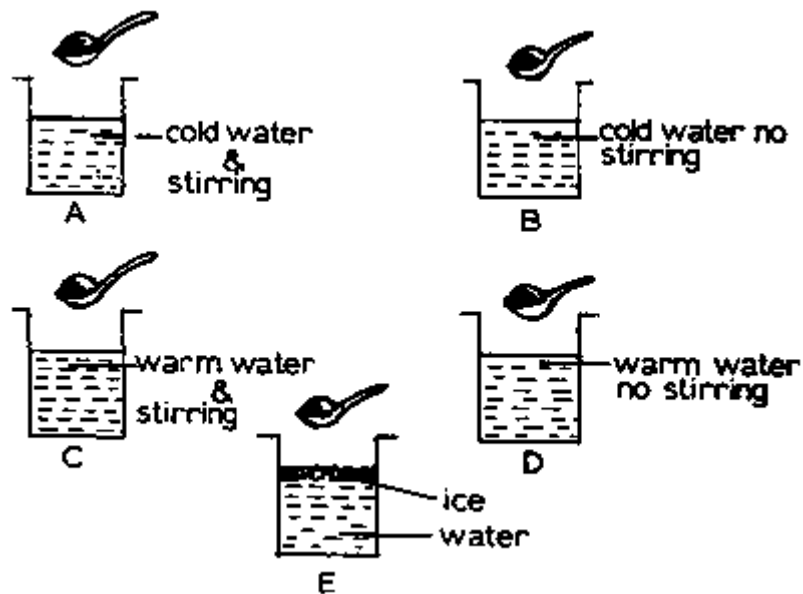


Figure 7

50. The jars in the diagram contain equal amounts of water. In which of the jars will table salt dissolve fastest?

- A.
- B.
- C.
- D.
- E.

4. Examples of Follow-up Communications after the Examinations

4.1. Kenya Certificate of Primary Education (KCPE) 8-4-4 K.C.P.E. Newsletter 1992 (abstracts)

by Research Section, Kenya National Examinations Council

THE KENYA NATIONAL EXAMINATIONS COUNCIL

8-4-4
K.C.P.E
NEWSLETTER
1992



Introduction

The Kenya National Examinations Council has been producing KCPE Newsletters for the last six years. During this time, classroom teachers have had access to information about pupils' weaknesses in examinations. Teachers should have realised that pupils generally make the same type of mistakes and tend to be weak in certain areas of the syllabus. In the past, possible causes of these mistakes and possible approaches to teaching that would improve learning and hence performance have been suggested.

Teachers have, no doubt, obtained a lot of useful information from both formal and informal assessment of their pupils. The Newsletter is not meant to be a one way form of communication. It is meant to initiate dialogue between the Kenya National Examinations Council and classroom teachers.

We would like to encourage teachers to send to us their suggestions as to why pupils continue to perform poorly in certain areas of the syllabus in spite of our highlighting their weaknesses in these areas and even recommending corrective measures. We would like

teachers to make use of the newsletter by making constructive suggestions and recommendations so that their experiences can benefit many teachers. They could, for example, suggest those methods of teaching that they have used and proved effective in enhancing the learning of those topics that pupils often have problems with. They could also give pupils' weaknesses that have not been highlighted in these newsletters. The information we are requesting teachers to provide could be sent to the Council, as a separate report, together with the tear-off post-examination questionnaire provided at the back of the newsletter which we encourage teachers to continue responding to.

Science

INTRODUCTION

The Science section of the Science and Agriculture paper was set in accordance with the general aims stated in the syllabus that have to be achieved over the 8-year primary education cycle. It tested the various skills that the candidates were expected to have acquired during their 8 years of primary education. The skills were tested using different content areas from the syllabus.

Table 1 shows these skills and the performance of the candidates in each skill. Similar information is also included for the 1990 KCPE for purpose of comparison.

Table 1

MAIN SKILLS TESTED	MEAN % OF CANDIDATES SCORING CORRECTLY	
	1990	1991
Recall	49.20	47.94
Comprehension	53.40	53.47
Application	29.12	39.40
Higher abilities (analysis, synthesis & evaluation)	63.04	60.30

From the table above, it can be observed that the performance of the candidates was poorer in those questions that tested application of knowledge in the two years. Teachers should therefore pay more attention to the application of the knowledge and skills that the pupils learn to their everyday life experiences.

OVERALL PERFORMANCE

An indication of performance in each of the 30 Science items is shown in Figure 6. In this figure, the relative difficulty of each item can be seen at a glance. In addition, the performance of the candidates in the 1991 KCPE Science section is given in Table 2 below. This is based on a random sample of 24,136 candidates. The 1990 performance is also provided in the table for comparison.

Table 2

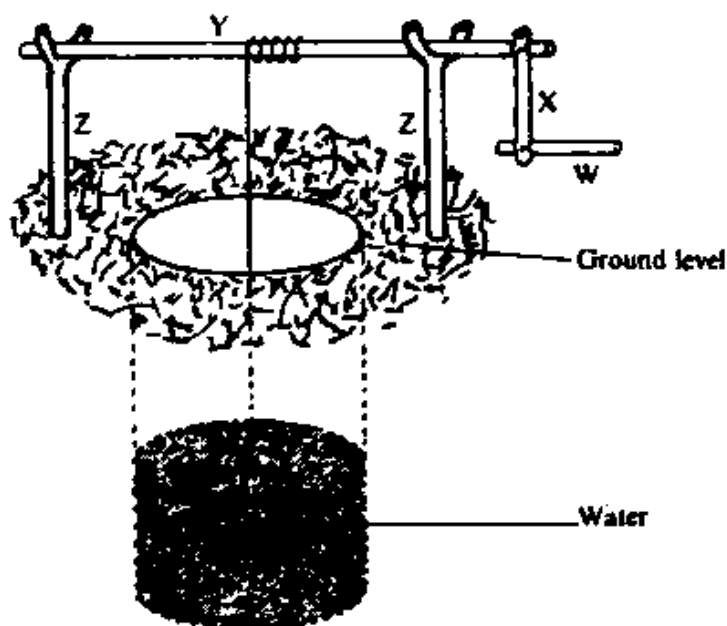
	1990	1991
MEAN RAW MARK/30	15.02	14.78
STANDARD DEVIATION	4.13	4.48

From table 2, the following conclusions could be made:

- (i) The overall performance in 1991 is comparatively lower although the spread of the candidates is slightly better.
- (ii) there is no significant difference in performance in the two years.

Question 18

18. Fatuma raised some water from a well using a winch like the one shown in the diagram below.



Which one of the following would help her to reduce the effort needed to raise the water?
Increasing the length of the part labelled

- A. W
- B. X
- C. Y
- D. Z

RESPONSE PATTERN

Option	A	B*	C	D
% choosing the option	47.13	18.61	19.93	13.54
Mean mark in other questions	14.05	17.29	13.84	15.48

The question was testing the application of knowledge on machines. To choose the correct answer, the candidates were expected to understand the relationship between the effort used and the effort distance. The effort is inversely proportional to the distance through which it moves. Thus, the longer the part labelled X is, the less the effort used.

About 50% of the candidates in the sample chose option A implying that the effort distance is the part labelled W which is incorrect. Others thought the part labelled Y is the effort distance. Such a confusion could only result from pupils' lack of knowledge on simple machines. Pupils cannot understand this topic fully if they are taught by chalk and talk method. They should be given a chance to do things and find out for themselves.

Question 26

26. The slowest way of recycling carbon in sawdust is by

- A. putting the sawdust in the cowshed
- B. putting the sawdust in the shamba
- C. using the sawdust in a jiko for cooking
- D. using the sawdust for making hardboards.

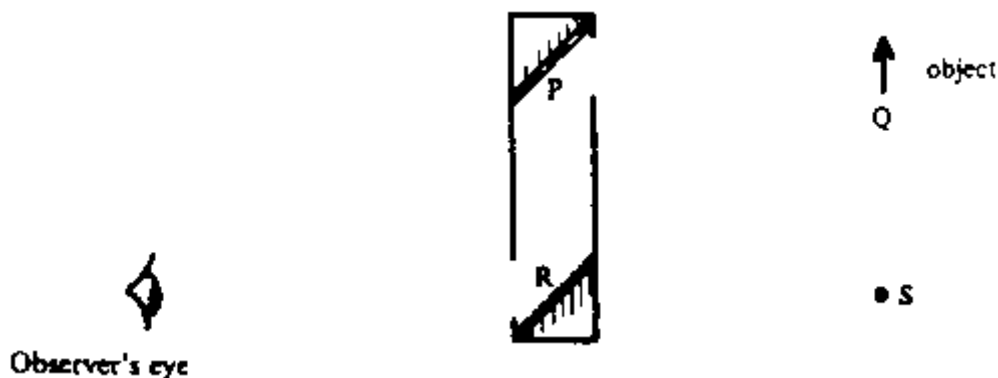
RESPONSE PATTERN

Option	A	B	C	D*
% choosing the option	20.30	26.09	23.47	29.21
Mean mark in other questions	14.87	14.99	13.30	15.82

This question was testing the candidates' knowledge on what happens to sawdust under different conditions. It was scored correctly by the bright candidates. The response pattern also shows that the mean mark in the rest of the question was a mark or two about the sample mean. This indicates that there was an element of guessing by most candidates. This would result from lack of understanding of what recycling of carbon in sawdust means. The correct option, D, was missed by many candidates probably due to their ignorance of what hardboard is. The poor performance on this item could also have resulted from the candidates' choosing an answer in haste before they could clearly understand what was being asked for. The word »slowest« in the stem was key to choosing the correct answer. Thus there is need for teachers to urge their pupils to try to understand what is being asked for before choosing an answer.

Question 27

27. The diagram below represents a periscope, an object and an observer's eye.



The image of the object as seen by the observer will appear at

- A P
- B Q
- C R
- D S

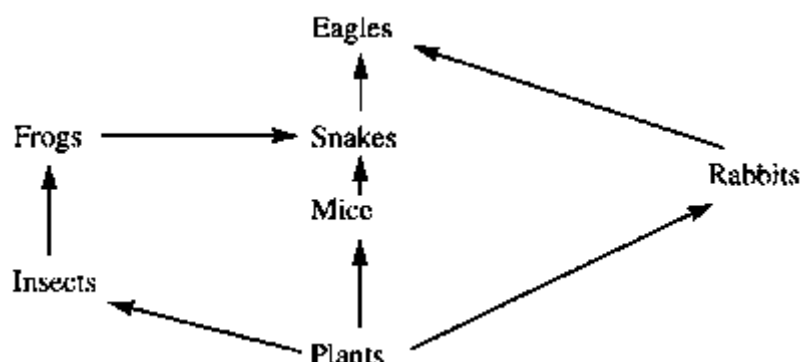
RESPONSE PATTERN

Option	A	B	C	D*
% choosing the option	16.84	15.10	51.26	15.99
Mean mark in other questions	13.72	12.82	15.86	14.50

A periscope uses plain mirrors and therefore the candidates were expected to use their knowledge of the properties of a plain mirror to answer this question. The small percentage of candidates who scored this item correctly shows that most candidates did not have this knowledge. More than half of the candidates in the sample chose option C which shows that the image is formed on the mirror. Anyone who has ever used a plain mirror to view himself/herself knows that this is not true. One's image always appears to be formed behind the mirror. Simple experiments done by the pupils using plain mirrors would help them to know that the image of an object placed in front of a plain mirror is formed behind the mirror. Thus teachers should seize every possible moment to have their pupils perform simple experiments to make their acquisition of scientific concepts easier and faster.

Question 28

28. Study the diagram of the food web below and answer the question that follows.



Which of the following animals should be most abundant in the food web?

- A. Insects
- B. Snakes
- C. Frogs
- D. Rabbits

RESPONSE PATTERN

Option	A*	B	C	D
% choosing the option	10.70	65.89	7.70	14.84
Mean mark in other questions	14.84	15.15	13.87	13.75

The candidates were expected to know that a food web is a complex feeding relationship of organisms consisting of several food chains. In each food chain, the most abundant organisms are those at the lowest trophic level and the numbers of organisms decrease as one goes up the food chain. In this question, insects, mice and rabbits occupy the same trophic level, that is, they all feed on plants. Ideally, their numbers are expected to be similar but in this food web, snakes and eagles have an alternative source of food. Snakes feed on frogs and mice while eagles feed on snakes and rabbits. On the other hand, frogs have no alternative source of food for they feed only on insects. Thus insects should be more abundant compared to mice and rabbits because they are the only source of food to the frogs.

The fact that about 65% of the candidates chose option B shows that they did not understand how numbers of organisms in a food web vary depending on the trophic level a particular organism occupies. To help the pupils understand clearly feeding relationships and their influence on the numbers of organisms, teachers should approach this topic from a practical point of view. A small scale ecological study would help pupils to understand better than if food webs and food chains are explained merely by use of drawings on the chalk board.

GENERAL COMMENTS AND ADVICE TO TEACHERS

1. Questions that were based on topics that ought to have been taught practically were poorly done in most cases. This indicates that some of the teachers could be teaching Science largely theoretically. It is advisable that teachers should try to have their pupils perform most of the simple experiments. This would enhance their acquisition of Scientific knowledge and formation of sound Scientific concepts. Science should be taught through an investigatory approach whenever possible.

2. Candidates' poor performance in some questions resulted from their lack of knowledge on the relevant syllabus topics. This could have been due to poor syllabus coverage or ineffective instruction. Teachers should plan their teaching to ensure that each syllabus topic

is given the attention it deserves. Poor planning causes backlog of work which forces teachers to teach in haste, and hence disregarding the pupils' learning pace, only serves to confuse them.

3. Most of the questions that the candidates found difficult also required the candidates to reason out and extrapolate learned information. Teachers are advised, therefore, to train their pupils in the art of reasoning and applying learned information to new situations.

Agriculture

INTRODUCTION

The analysis of performance in Agriculture is based on a sample of 24,136 candidates drawn from both rural and urban schools. Table 1 below shows a summary of the overall performance in the Agriculture section of the Science and Agriculture paper.

Table 1

Year	1990	1991
RAW MEAN OUT OF 30	17.60	16.97
STANDARD DEVIATION	3.71	4.26

Table 1 shows that there was a slight drop in performance compared to the previous year. However, there was a better spread of marks as indicated by the bigger Standard Deviation. The performance of candidates in all questions is shown in Figure 7.

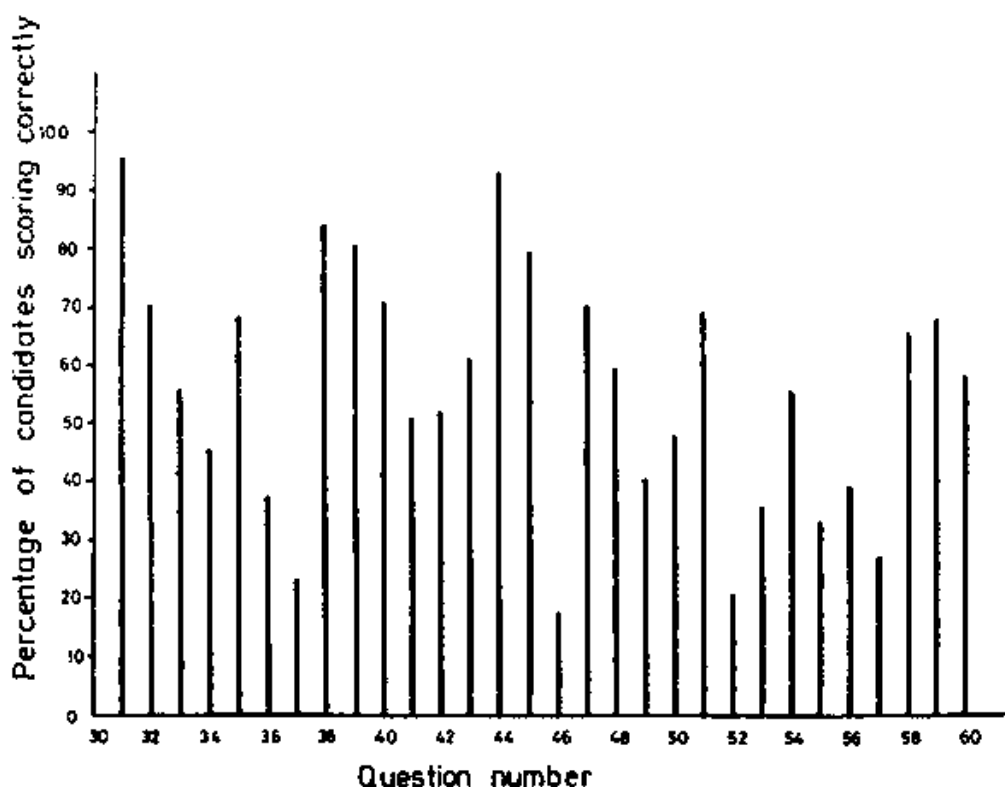


FIGURE 7 - AGRICULTURE

From Figure 7, it is evident that candidates found some questions more difficult than others. Questions which were scored correctly by less than 30% of the candidates are considered to be difficult. The performance of candidates in these questions is shown in Table 2.

Table 2

Question Number	37	46	52	55	57
% of candidates choosing correct response	23.90	17.28	21.82	31.16	27.85

ANALYSIS OF THE DIFFICULT QUESTIONS

In each question discussed, a response pattern showing the percentage of candidates choosing each of the four responses and their mean marks in other questions is given. The correct response in each question is indicated with an asterisk (*).

Question 37

37. Which set of symptoms given below indicates fowl pox disease in chicken?

- A. Dullness and swellings on the head.
- B. Diarrhoea and lack of appetite.
- C. Crowding and stretching of the neck.
- D. Diarrhoea and crowding.

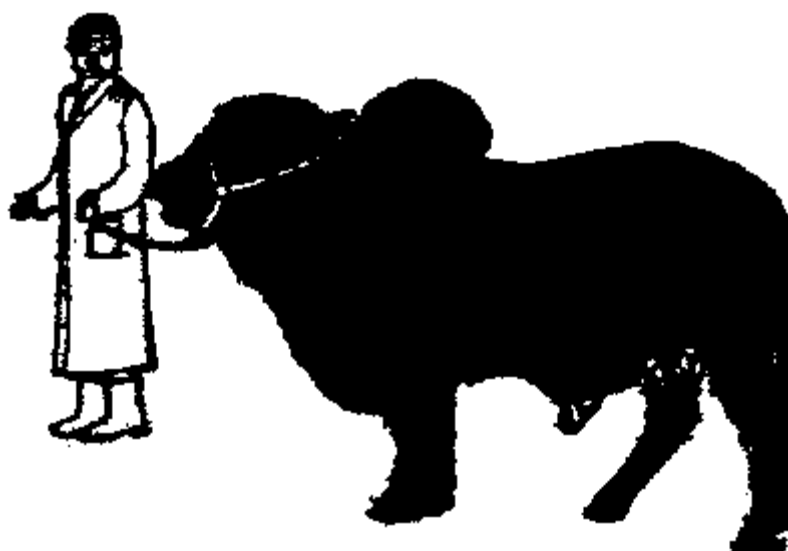
RESPONSE PATTERN

Option	A*	B	C	D
% choosing the option	23.90	42.24	20.30	12.95
Mean mark in other questions	17.91	17.09	15.94	16.79

In this question, many candidates chose Diarrhoea and lack of appetite as symptoms for fowl pox disease in chicken. It is true that loss of appetite is a symptom for so many diseases and diarrhoea is also a symptom of a few intestinal diseases. However, these should not be confused with fowl pox disease which is manifested by characteristic swellings on the head. Pupils should be familiar with the general causes of livestock diseases, their symptoms and control measures since death of livestock is a major cause of loss in livestock production. The schools which may not have livestock are encouraged to take their pupils to institutions or farms where the required animals are kept.

Question 46

46. The illustration below shows a herdsman leading a bull for exercise using a halter.



Leading a bull this way is NOT safe because the halter

- A. will hurt the bull
- B. will interfere with the feeding of the bull
- C. will interfere with the breathing of the bull
- D. is not sufficient to restrain the bull.

RESPONSE PATTERN

Option	A	B	C	D*
% choosing the option	7.76	35.74	38.54	17.28
Mean mark in other questions	16.06	17.06	16.81	17.78

A small percentage of candidates got the correct response in this question. They were the more able candidates as seen from their mean mark in other items. Responses B and C attracted high percentages of candidates. Since these responses referred to the halter interfering with either the feeding or the breathing of the bull, many candidates thought the halter is tied so tightly that it will interfere with the animal. Many candidates were merely guessing the answer. It can be deduced that many candidates had neither seen a halter, which is a specially designed rope for restraining cattle, nor handled bulls or seen bulls being walked around for exercise. The safest way to handle bulls is to fix a leadstick onto the bull-ring at the nose. Since the skin at the bull's nose onto which the ring is fixed is delicate, a bull will keep calm as any violent movement will hurt it. It should be borne in mind that bulls can be vicious and should always be handled with care. However docile they may appear to be, bulls should not be taken for granted.

Question 52

52. Which one of the following factors will influence the efficiency of farm labour?

- A. Size of the farm.
- B. Market for the produce.
- C. The number of farming activities in the farm.
- D. Training on relevant skills.

RESPONSE PATTERN

Option	A	B	C	D*
% choosing the option	27.28	13.08	37.17	21.82
Mean mark in other questions	16.95	15.27	16.68	18.69

The question was testing how to manage farm labour for efficient performance of farm work. Labour efficiency refers to the ability of workers to carry out a given task well and fast. To be able to do this, training on the relevant skills is necessary.

The response pattern indicated a lot of guess work. Response C attracted the highest percentage of candidates followed by A. The number of farming activities in the farm like growing maize, bananas, wheat, and rearing poultry and pigs cannot influence the efficiency of farm labour because in a well managed farm, labour is usually attached to a given enterprise. Alternatively, workers would be assigned a few tasks within one or more enterprises which the workers can manage.

Question 55

55. The reason for washing the udder with warm water before milking a cow is to

- A. kill germs on the udder
- B. enable the cow to produce more milk
- C. remove dirt from the udder
- D. soften the teats.

RESPONSE PATTERN

Option	A	B	C*	D
% choosing the option	36.35	7.08	31.16	22.92
Mean mark in other questions	16.58	16.14	17.65	17.03

This question was not so poorly done. It was scored correctly by slightly more than 30% of the candidates. Since it was a borderline case, it is also worth discussing.

The majority of the candidates chose the wrong option A. Warm water does not kill germs. The temperature of water capable of killing germs can scald the skin of the milkman and the cow's udder. It was the more able candidates who scored the right response. Apart from removing dirt from the udder, warm water also helps to stimulate milk let down in the udder.

Question 57

57. A farmer noticed his crop growing slowly and the leaves showing purple colouration. What plant nutrient was lacking in the soil?

- A. Nitrogen.
- B. Phosphorus.
- C. Potassium.
- D. Sulphur.

RESPONSE PATTERN

Option	A	B*	C	D
% choosing the option	48.35	27.85	17.51	5.63
Mean mark in other questions	17.20	17.74	16.25	15.76

The response pattern reveals that only 27.85% of candidates in the sample, who happen to be the most able ones got the correct response. A high percentage of candidates chose Nitrogen. Whereas deficiency of Nitrogen results in slow or stunted growth, purple colouration is never observed. A characteristic deficiency symptom for Nitrogen is yellow colouration. Some deficiency symptoms of major plant elements overlap. However, there are certain unique symptoms for each element. It is important to remember that all the macro-nutrient elements are very important for plant nutrition and pupils should learn about their roles, and deficiency symptoms exhibited in growing plants.

GENERAL GUIDANCE TO TEACHERS

It has already been pointed out that teachers should arrange for their pupils to visit farms or agricultural institutions. They should also cover all the parts of the syllabus.

We would add that teachers should give exercises based on various cognitive levels to their pupils. This will ensure that the pupils do not only memorise what they have been taught, but are also encouraged to think on their own and argue out answers to questions.

4.2. Lesotho Primary School Leaving Examination P.S.L.E. Report (May 1990) (abstracts)¹

¹ This report has been compiled by the Evaluation, Research and Testing Division of the N.C.D.C. It has been prepared by the various subjects divisions at the centre using the item analyses prepared by the Education Statistics Unit at the centre.

by National Curriculum Development Centre (N.C.D.C.), Ministry of Education

**NATIONAL CURRICULUM DEVELOPMENT CENTRE
(N C D C)
MINISTRY OF EDUCATION
1989 P.S.L.E. REPORT
MAY 1990**

**EVALUATION, RESEARCH AND TESTING DIVISION
P.O. BOX 1126
MASERU**

Introduction

This is the first report of the Primary School Leaving Examinations (P.S.L.E.) since the establishment of the item bank. Since we would like to keep the reliability of the PSLE tests good we shall not quote the items that were in the tests but try to refer to whatever was in the item and needs attention, as closely as possible. After all we teach concepts and not items although items are used to find out if the concepts have been learnt or not. Examples, which are not necessarily the items which were in the tests, may be shown in the report.

Comments which can be addressed to: Education Testing Officer, N.C.D.C., P.O. Box 1126, Maseru 100 will be welcomed and useful to improve on this report.

This report is supposed to assist the teachers in improving on their instruction where necessary, or even to commend them where the instruction has been good. The report should serve as a mirror to the teachers, this is because the achievement of pupils does, in a way, reflect how effective the teaching has been. The teachers are thus encouraged to use this report maximally and give feedback, as much as they can.

In this report no comments have been made on Papers One and Two of English and Sesotho but hope to include them in future.

Science (General)

PURE SCIENCE

When referring to respiration in plants »stomata« and »breathing holes« should not be considered as different things altogether because in actual fact stomata are holes through which a plant breathes and it could be correct to say »stomata« are »breathing holes«.

The functions of the different parts of a seed, like the radicle, the inside, outer covering should be distinguished. The pupils seemed to confuse the functions of these parts.

Pupils still seem not to be sure of the different parts of a flower, they are not able to identify the different parts from a drawing. When teaching such topics it is necessary to have a sample of a flower for example or observe fertilisation by agents such as bees. The topic should be treated as practical as possible.

The distinction between an amphibian and a reptile need to be made since the pupils seem to confuse the two. There are some reptiles that are amphibians and those that are not.

Pupils seem not to be clear about when contraction takes place and when expansion takes place due to the effect of heat. For these two concepts to be learnt well, they should be taught practically, the pupils should observe expansion taking place and also contraction and be aware which effect of heat causes either of them and be sure which word is used for which process.

The changes from one state of matter to another do not seem to be very clear to the pupils like from solid to liquid, liquid to gas and the reverse. These should also be taught practically so that pupils can see as to what changes take place under which circumstances and the words used for the different changes.

The direction in a food chain should have meaning like »from - to«, which would imply that from one thing the next is produced or found. Various examples should be given to explain the chain. If the direction is in the opposite direction that seems to confuse the pupils.

HOME ECONOMICS

Pupils do not seem to be aware of all the different methods of cooking. All methods of cooking should be clearly explained to the pupils, even if they are not all demonstrated. These explanations should, of course, be accompanied by examples in which the different methods are used.

It seems that the functions of different foodstuffs have been well-taught. The term »complete food« does not seem to be familiar to some pupils. There is need to clearly explain what is meant by »complete food« giving the example of young ones that live only on one kind of food but survive. This implies that the one food that the young ones live on is sufficient for their livelihood hence it is a »complete food«. That is why breastfeeding is recommended more than anything else for babies.

The grouping of various food-stuffs should be clearly explained to pupils and they should be given regular exercises in classifying different foodstuffs. In other words, when given a certain kind of food pupils should be able to state what nutrient or nutrients the particular food has and thus be able to differentiate foods according to their nutrients.

HEALTH AND PHYSICAL EDUCATION

Pupils do not seem to know about diseases that are caused by pests that are not found locally. There is need when teaching about diseases caused by pests, to include even those diseases that are not found locally, like the tropical diseases.

What is taught about personal hygiene and can be done practically should then be taught practically and whenever possible let the pupils practise it at school, for example, washing one's hands when one comes from the toilet. Pupils do not seem to be aware of some of common personal hygiene practices which they could learn easily through practice.

There is need to explain to pupils the dangers of some of the unhygienic practices, for example it should be made clear why eating food from a rubbish pit or bin may be dangerous, that is, how it can cause diseases.

When teaching about care of the different parts of the body emphasis should be laid on improper common practices and these should be discouraged explaining what dangers those might have to the particular part of the body, for example, the rubbing of the eye when there seems to be a foreign particle that has entered the eye.

It seems not to be clear to pupils as to what exactly happens to people who die because there is a coal fire burning inside a closed house with no fireplace with a chimney. It should be explained that they die because of inhaling the poisonous gas, carbon monoxide and not necessarily because there was no oxygen to be inhaled, it should be made clear that it is the presence of the carbon monoxide in the blood system that causes the death.

Causes of the common diseases, especially those that may be epidemic should be known to the pupils, this will be of help to the students to advise on how epidemic diseases can be avoided where possible or to stop one if it is already taking place.

AGRICULTURE

When teaching pupils about the improvement of soil that is poor more emphasis should be laid on the use of manure rather than on the use of artificial fertilizers which only provide nutrients to the plants and not necessarily improving the quality of the soil.

The use of the term »seed bed« should be discouraged instead the term »nursery bed« should be used because it is more correct. More emphasis should be laid on the techniques of planting vegetables. It should be known which vegetables should be planted directly and which can be transplanted and it should be explained why.

In the teaching of the subject the use of common words should be encouraged. For example, the term »organic matter« could be used instead of »humus«. This is because some pupils seemed not to know the meaning of the word »humus«.

Candidates did not seem to be clear as to how one type of soil differs from another. The pupils should be taught in detail the characteristics of the different types of soil. They should know the structure, the capacity to hold water, their nutritive value and so on.

It seemed not to be clear to pupils the need to prune trees. It should be clearly explained why trees should be pruned, how they should be pruned and when they should be pruned. Advantages gained should be given as against disadvantages of unpruned trees.

TRIAL SCIENCE

The topic on magnetism seems to be well-treated, the pupils are aware of the basic concepts in magnetism, but they seem to lack the practical experience. Thus more practical work, even in the form of demonstrations should be done.

The meanings of the words »float« and »sink« do not seem to be distinguishable to the pupils. The distinction should be clearly made between these two words and this could be done with the assistance of a demonstration with a few substances that sink in certain liquids, especially water, and those that float in those liquids. Here should be included liquids that float on other liquids. It should be explained that floatation depends on density, for example, if the volume of a substance can be increased while its mass remains the same then its density decreases (it becomes lighter) and it can float, like an inflated balloon.

Pupils do not seem to be aware of the interdependence between the various species of nature. In the teaching of ecology emphasis should be laid on how one thing depends on the existence of another and how that second one depends on yet another thing. For example, animals depend on plants for food while the plants depend on the sun for energy.

Pupils only hear about certain instruments used for measuring various quantities in science but have no idea as to how the instruments look like, and thus how they work. As much as possible instruments used to make measurements should be shown to students and they should use them, if possible, but if it is not possible demonstrations should be made on their use.

Some pupils cannot make the difference between solution, solvent and solute. First, it is necessary to clearly explain the process of dissolving and then make the distinction between the solvent and the solute and hence the mixture, which is the solution.

Practical work should be done with balances to explain the state of equilibrium and of no equilibrium. It should be clear as to how the balance swings when there is a heavier load on one side.

Since breathing organs differ from animal to animal or between certain families of animals it should be clearly explained how these differ including the names used for different breathing organs.

Some pupils could not differentiate between certain animals according to their structure. More detail should be given when teaching about structure of different animals, for example, which are covered with scales, which with no bones, which with legs and so on.

The use of machines, that is, levers and pulleys should be done practically because the pupils seem not to be aware how some of the machines work.

The water retaining capacity of soil should be taught practically and the kind of soil suitable for making bricks should be explained to pupils. The fact that soil has air inside it should be shown practically.

Some pupils seemed not to be clear of the life stages of an insect, this could be taught as suggested in the syllabus.

The difference between perimeter and area should be clarified, as it seemed not clear to some pupils.

Conduction of electricity should be taught practically.

More emphasis should be laid in the teaching of friction, especially the effects of friction.

Pupils should be taught different kinds of clouds and also stars, it should not be taken for granted that they know them. For clouds, the examples given should be familiar to the pupils.

SUMMARY

The test with the highest reliability was Mathematics with a (Kuder-Richardson Formula 20) KR20 reliability coefficient of 0.861, this was followed by Trial Science with 0.816 then English Paper 3 with 0.768 next Social Studies with 0.751 and then Sesotho with 0.719 and lastly Science (General) with 0.711.

The following table shows the total score, the mean score and the standard deviation (S.D.) for each paper (here the Papers I and II for Sesotho and English have been included but Trial Science is not).

Paper	Science	Social Studies	Maths	Sesotho Paper I	Sesotho Paper II	Sesotho Paper III	English Paper I	English Paper II	English Paper III
Total Score	50	50	50	25	15	40	24	18	50
Mean	22,21	26,41	27,6	16,63	10,23	30,08	9,02	7,25	25,46
S.D.	7,09	7,56	8,53	2,77	2,05	4,24	4,23	2,42	7,55

The total number of candidates was 26,181 and the overall pass percentage was 82.3, that is 21,539 candidates passed. There were 2,774 first, 4,867 second and 13,898 third class passes and 4,642 failed.



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2.0 BASIC SCIENCE & HEALTH EDUCATION

In Basic Science and Health Education, the common errors encountered during the marking were:

- confused facts on parasites and vectors e.g. Question 44.
- The language and expression were poor, use of mother tongue in some scripts.
- Spellings were poor.
- Lack of understanding of instructions. Could not explain or describe as expected.
- Poor illegible handwriting.
- Use of guess work especially on questions concerning sex.

SECTION A

1. How do we prevent babies from getting measles?

..... We prevent babies from getting measles by immunisation

2. How is rusting similar to breathing?

.....

3. What First-Aid would you give to a person who has been bitten by a snake?

..... The first-aid would you give a person who has been bitten by a snake
by fracture

4. Why should children be stopped from eating a lot of sweets?

.....

5. What is the main method through which AIDS can be spread from one person to another?

..... The main method through which AIDS can be spread from one person to
another ~~is by sexual intercourse~~
another by sexual intercourse

6. Why should drinking water be boiled?

..... We should drinking water be boiled because the water was contaminated

7. Name the common substances used to make an oral rehydration solution.

..... The common substances used to make an oral rehydration solution hydration

8. What is the best food for a baby of less than one year?

..... The best food of for a baby of less than one year is milk

9. To which group of food crops does rice belong?

..... The group of food crops does rice belong is called serious

10. Give one reason why vitamin C is important in our diet.

..... Because vitamin C is important ~~and~~ when you fruit

2.1 Sample of a poor script

The sample scripts show that the candidate has little knowledge of the subject matter. In the 1st sample, he cannot express himself correctly in English although he tries to answer in full sentences. Spellings are very important especially of Science words as a candidate can fail because of that, for instance answers given to question 9. 'serious' - may be the candidate wanted to write 'cereals', question 12. 'longershitedness' was 'long sightedness'.

SECTION A

1. How do we prevent babies from getting measles?

We prevent babies from getting measles by immunisation at nine months.

2. How is rusting similar to breathing?

Rusting is similar to breathing because they both need oxygen in order to take place.

3. What First-Aid would you give to a person who has been bitten by a snake?

The first-aid I would give to a person bitten by a snake is tying a piece of cloth above the bitten part to prevent poison from going to the heart & take to a health worker.

4. Why should children be stopped from eating a lot of sweets?

Children should be stopped from eating a lot of sweets because eating a lot of sweets causes dental caries.

5. What is the main method through which AIDS can be spread from one person to another?

Aids can be spread from one person to another mainly by having sexual intercourse with an infected person.

6. Why should drinking water be boiled?

Drinking water should be boiled to kill germs.

7. Name the common substances used to make an oral rehydration solution.

Salt, sugar and water are the common substances used to make an oral rehydration solution.

8. What is the best food for a baby of less than one year?

Breast milk is the best food for a baby of less than one year.

9. To which group of food crops does rice belong?

Rice belongs to a group of food crops called ~~carbohydrates~~ cereals.

10. Give one reason why vitamin C is important in our diet.

Vitamin C is important in our diet because it protects us from scurvy.

11. Name one way through which foot and mouth disease is spread among cattle.

Foot and mouth disease is spread among cattle when the infected ones feed together with the uninfected ones.

2.2 Sample of good script

A good candidate answers in full sentences, and puts in detail to show that he/she understands the subject.

DSE in Brief

The German Foundation for International Development (DSE) is an institution which provides a forum for development policy dialogue and the initial and advanced training of specialists and executive personnel from developing and transitional countries. In addition, it supports German experts preparing themselves for their assignments in developing countries and maintains the Federal Republic of Germany's largest centre for documentation and information on development cooperation issues.

Conferences, meetings, seminars and training courses support projects which serve economic and social development, thus contributing to an effective, sustainable and wide-ranging development process.

The DSE cooperates with partners at home and abroad. A considerable number of the programmes take place in the developing countries, and the rest in Germany. Since 1960 the DSE has given advanced professional training to more than 120,000 decision-makers, specialists and executive personnel from over 150 countries. Through its dialogue and training events the DSE currently reaches more than 10,000 participants annually.

Founded in 1959, the DSE contributes to development cooperation on the basis of the guidelines of the German Federal Government's development policy. The institutional donor is the Federal Ministry for Economic Cooperation and Development (BMZ). Some of the DSE programmes are, however, financed by other donors (e.g. other Federal ministries, the Federal Länder, the European Union).

Also, the Federal Länder of Baden-Württemberg, Bavaria, Berlin, North Rhine-Westphalia and Saxony have made conference and training centres available. Since its establishment, the DSE has been jointly financed by the Federation and the Länder. This finds expression in the decentralized structure of the German Foundation with its specialized departments (Centres) and conference centres in a number of Federal Länder.