

GRADE 10 ENDTERM 3 EXAMS

ALL SUBJECTS

(STEM PATHWAY SET)

Elevate revision with our premium Grade 10 End-Term 3 Exam Pack! This meticulously organized, all-inclusive toolkit covers every subject with detailed, high-standard papers mirroring current assessments. Boost confidence and guarantee academic mastery with the ultimate, ready-to-deploy exam resource.

ALL SUBJECTS TESTED.

Core Mathematics, Essential Mathematics, English, Kiswahili, Biology, Chemistry, Physics, General Science, Computer Studies, Applied Agriculture, Home Science, Aviation Technology, Building & Construction, Electricity, Metal Work, Power Mechanics, Wood Technology, Media Technology, Marine & Fisheries Technology, CSL and Physical Education.

SMART-GRADE SERIES

For Marking Schemes

Mr Isaboke 0746-222-000 / 0753-222-000

MWALIMU CONSULTANCY

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

BIOLOGY

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

1. Write your name, assessment number, class/stream and date in the spaces provided.
2. Read all questions carefully before answering.
3. Answer ALL questions.
4. Show all working where calculations are required.
5. Draw and label diagrams clearly where required.
6. Use appropriate units in calculations.
7. Answer in the spaces provided where applicable.
8. Use clear and legible handwriting.
9. Check that all pages and questions are present before beginning.
10. The paper contains structured-response questions only.

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
	1–5	25	
B	6–9	25	
C	10–12	30	
TOTAL		80	

SECTION A — STRUCTURED QUESTIONS

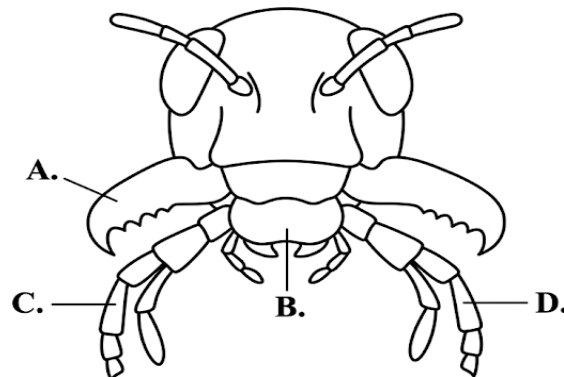
1. State two functions of the mouthparts of insects in relation to feeding. (4 marks)
 - (a) Name the type of mouthpart adapted for biting and chewing in insects. (1 marks)
 - (b) Give two features of this type of mouthpart that make it suitable for its mode of feeding. (3 marks)
2. Birds have different types of beaks adapted to different feeding habits. (5 marks)
 - (a) State two types of food on which birds may feed. (2 marks)
 - (b) Explain how the shape of a bird's beak is related to its feeding habit. (3 marks)
3. Distinguish between open and closed circulatory systems. (4 marks)
 - (a) Name one group of animals that has an open circulatory system. (1 marks)
 - (b) State one advantage of a closed circulatory system. (2 marks)
 - (c) State one type of circulatory system found in fish. (1 marks)
4. Explain the importance of transport systems in animals. (4 marks)
 - (a) State two substances transported in the blood of mammals. (2 marks)
 - (b) Give two materials that must be transported away from body tissues. (2 marks)
5. A learner investigates pulse rate before and after physical exercise. (8 marks)

Condition	Pulse rate (beats per minute)
Before exercise	72
Immediately after exercise	126
Five minutes after exercise	94
Ten minutes after exercise	76

- (a) Calculate the increase in pulse rate immediately after exercise. (2 marks)
- (b) Describe the trend in pulse rate during the ten-minute recovery period. (2 marks)
- (c) Explain why pulse rate increases during vigorous exercise. (2 marks)
- (d) State two factors that could affect the rate at which pulse returns towards the resting value. (2 marks)

SECTION B — APPLICATION, DATA AND DIAGRAMS

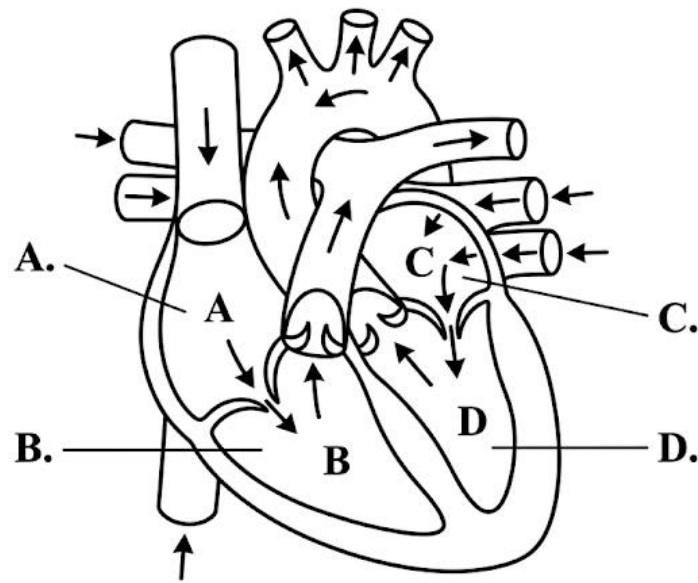
6. The diagram below represents a simplified insect mouthpart structure. (8 marks)



- (a) Identify structures A and B. (2 marks)
- (b) State one function of structure C. (2 marks)
- (c) Explain how the structures shown enable the insect to obtain and process solid food. (4 marks)

7. The diagram below represents a simplified mammalian heart.

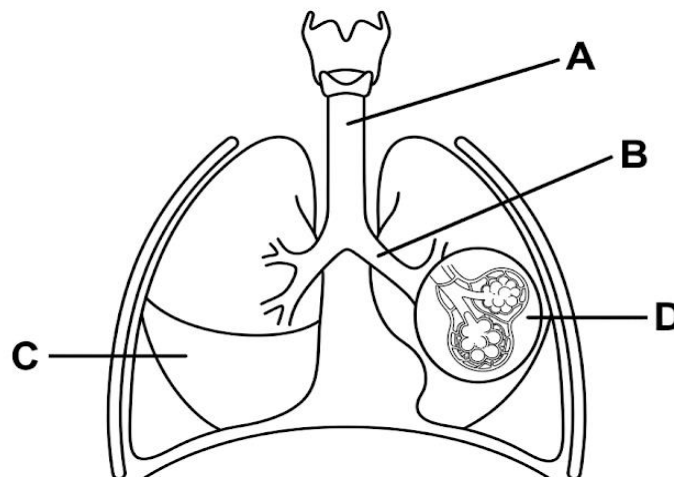
(7 marks)



- (a) Name chamber A and chamber D. (2 marks)
- (b) State the function of the valve system in the heart. (2 marks)
- (c) Explain why the left side of the mammalian heart has a thicker muscular wall than the right side. (3 marks)
8. A learner records the following observations from blood-group tests. (5 marks)

Sample	Reaction with anti-A	Reaction with anti-B
P	Agglutination	No agglutination
Q	No agglutination	Agglutination
R	Agglutination	Agglutination
S	No agglutination	No agglutination

- (a) Determine the ABO blood group of samples P and R. (2 marks)
- (b) Explain why ABO compatibility is important during blood transfusion. (3 marks)
9. The diagram below represents a simplified respiratory system. (5 marks)



- (a) Identify structures A and B. (2 marks)
- (b) State two adaptations of the alveoli for efficient gaseous exchange. (3 marks)

SECTION C — EXTENDED STRUCTURED APPLICATION

10. A learner compares gaseous exchange in a fish and in a mammal. **(10 marks)**

(a) Name the main gaseous exchange surface in a fish and that in a mammal. **(2 marks)**

(b) Explain how the structure of fish gills is suited to gaseous exchange in water. **(4 marks)**

(c) Describe how oxygen reaches body cells in a mammal after it enters the lungs. **(4 marks)**

11. Respiration provides energy required for activities in animals. **(10 marks)**

(a) Distinguish between aerobic and anaerobic respiration. **(4 marks)**

(b) State the products of anaerobic respiration in animal muscle cells. **(2 marks)**

(c) Explain two circumstances in which anaerobic respiration may occur in muscles. **(2 marks)**

(d) State two reasons why anaerobic respiration is less efficient than aerobic respiration. **(2 marks)**

12. A learner investigates factors affecting breathing rate during exercise. **(10 marks)**

(a) State the relationship expected between exercise intensity and breathing rate. **(2 marks)**

(b) Explain why breathing rate increases during strenuous physical activity. **(4 marks)**

(c) Describe a simple investigation that could be used to determine the effect of exercise intensity on breathing rate. Include the variable to change, the variable to measure, two control variables and one safety precaution. **(4 marks)**

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

CHEMISTRY

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

1. Write your name and assessment details in the spaces provided.
2. Read all questions carefully before answering.
3. Answer all questions.
4. Show all working clearly where calculations are required.
5. Draw and label diagrams clearly where required.
6. Give appropriate units in numerical answers.
7. Use the chemical symbols, formulae and equations correctly.
8. Answer all questions in the spaces provided where applicable.
9. Use clear and legible handwriting.
10. Check that all questions and pages are present before submitting the paper.

EXAMINER'S USE ONLY

Section / Questions	Maximum Score	Candidate's Score
A: Questions 1–3	35	
B: Questions 4–6	35	
C: Questions 7–9	30	
TOTAL	100	

SECTION A — PERIODICITY AND CHEMICAL BONDING

1. The elements P, Q and R have atomic numbers 11, 17 and 18 respectively.

(a) Write the electron arrangement of P, Q and R. (3 marks)

(b) State the group and period of element Q. (2 marks)

(c) Explain why P is more reactive than R. (2 marks)

(d) State the type of ion formed by P and write its formula. (2 marks)

(e) Explain the trend in atomic size across a period from left to right. (3 marks)

2. The table below gives selected properties of four elements. (12 marks)

Element	A	B	C	D
Atomic number	3	12	17	18
Period	2	3	3	3
Valency	1	2	1	0

(a) Identify the element most likely to form a stable +2 ion. Give a reason. (2 marks)

(b) Write the formula of the compound formed between B and C. (2 marks)

(c) State the type of bonding in the compound in (b). (1 marks)

(d) Explain how the bonding in the compound in (b) accounts for its electrical conductivity when molten. **(3 marks)**

(e) State one use of a Group I element and one use of a Group VII element. **(2 marks)**

(f) State one physical property that generally changes down Group VII. **(2 marks)**

3. The simplified periodic table below represents selected positions of elements X, Y and Z.

(11 marks)

	GROUP I	GROUP II	GROUP VII	GROUP VIII
PERIOD 2				
PERIOD 3	X		Y	Z

(a) State the group and period of X. **(2 marks)**

(b) State the group and period of Y. **(2 marks)**

(c) Which of X and Y has the larger atomic radius? Give a reason. **(2 marks)**

(d) Predict the type of ion formed by Y and explain your answer. **(2 marks)**

(e) State one chemical property that distinguishes Group VII elements from Group VIII elements. **(3 marks)**

SECTION B — ACIDS, BASES AND THEIR APPLICATIONS

4. A learner tested three aqueous solutions A, B and C using indicators. Solution A turned blue litmus red, solution B turned red litmus blue, while solution C produced no change with either litmus paper. **(12 marks)**

(a) Classify A, B and C as acidic, basic or neutral. **(3 marks)**

(b) State the expected pH range for A and B. **(2 marks)**

(c) Explain what is meant by a universal indicator. **(2 marks)**

(d) Give two safety precautions that should be observed when handling concentrated acids or bases in the laboratory. **(2 marks)**

(e) State one household or industrial application of an acid and one application of a base. **(3 marks)**

5. A learner investigated the reaction of dilute hydrochloric acid with three substances: magnesium, sodium carbonate and copper(II) oxide.

(a) Write a balanced chemical equation for the reaction between hydrochloric acid and magnesium. **(3 marks)**

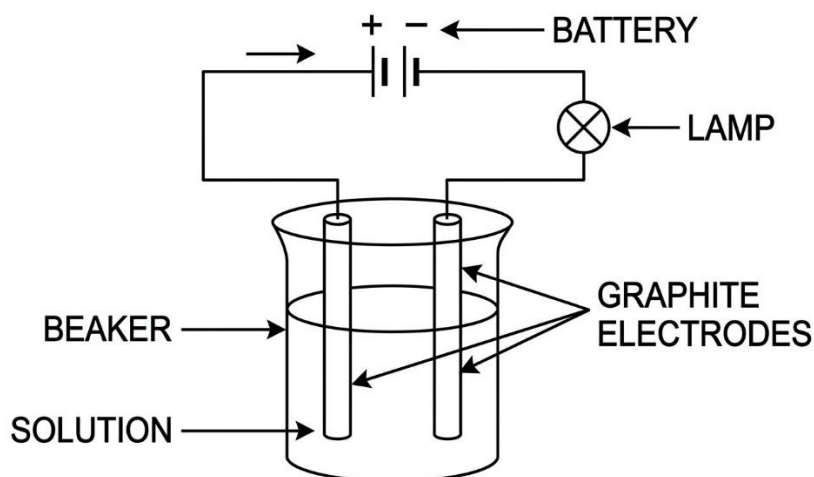
(b) Write a balanced chemical equation for the reaction between hydrochloric acid and sodium carbonate. **(3 marks)**

(c) State the observation when hydrochloric acid reacts with sodium carbonate. (2 marks)

(d) Name the type of reaction between hydrochloric acid and copper(II) oxide. (1 marks)

(e) Write the balanced equation for the reaction in (d). (3 marks)

6. The apparatus below is used to investigate the strength of an acid by measuring its electrical conductivity. (12 marks)



(a) Name the two electrodes shown. (2 marks)

(b) Explain why a strong acid conducts electricity more effectively than a weak acid of similar concentration. (3 marks)

(c) State two variables that should be kept constant when comparing the conductivity of the acids. (2 marks)

(d) Give one environmental or safety precaution for disposing of acid waste after the experiment.

(2 marks)

(e) State one reason why electrical conductivity is evidence of the presence of ions in solution.

(3 marks)

SECTION C — SALTS AND INTEGRATED APPLICATION

7. A learner is required to prepare dry crystals of copper(II) sulfate from copper(II) oxide and dilute sulfuric acid. **(10 marks)**

(a) State why copper(II) oxide is added in excess.

(2 marks)

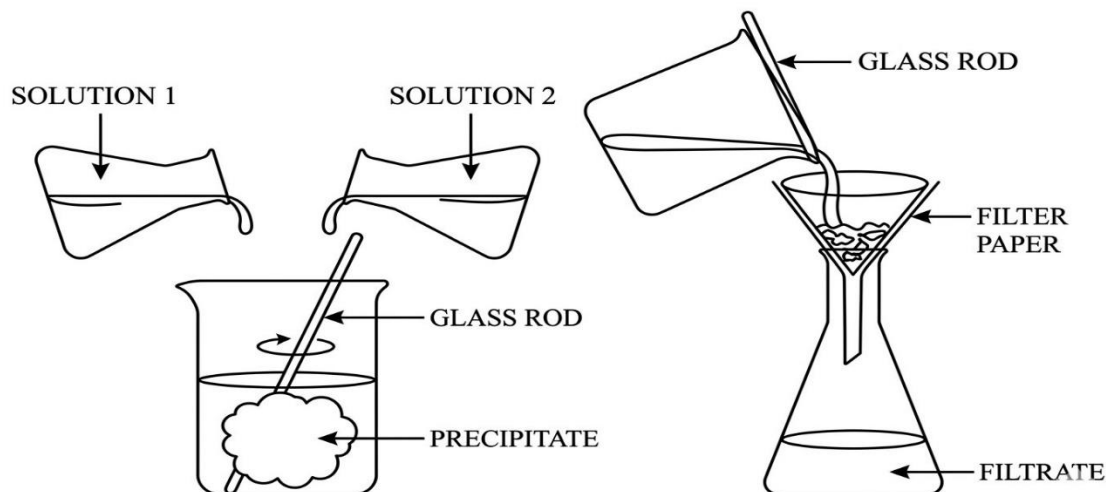
(b) Describe how the excess copper(II) oxide can be removed from the mixture. **(2 marks)**

(c) Explain how copper(II) sulfate crystals can be obtained from the filtrate. **(4 marks)**

(d) State one precaution necessary during the heating/evaporation stage.

(2 marks)

8. The diagram represents a method of preparing a soluble salt by precipitation. **(10 marks)**



(a) Define precipitation reaction. **(2 marks)**

(b) State the purpose of filtration in this method. **(2 marks)**

(c) Write a balanced chemical equation for the reaction between aqueous silver nitrate and aqueous sodium chloride. **(3 marks)**

(d) State one way in which laboratory salt waste should be managed to reduce environmental pollution. **(3 marks)**

9. Salts have applications in agriculture, food, medicine, industry and other areas. Some salts may also contribute to environmental problems when used excessively. **(10 marks)**

(a) State two uses of salts in agriculture. **(2 marks)**

(b) Explain one way excessive use of inorganic fertilisers can affect the environment. **(3 marks)**

(c) Distinguish between a soluble and an insoluble salt. **(2 marks)**

(d) A salt sample dissolves completely in water at room temperature. State the observation that would show that the salt is soluble and explain how you would confirm that no solid remains.

(3 marks)

END OF QUESTION PAPER

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

PHYSICS

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS

1. Answer ALL questions.
2. Show all working for numerical calculations.
3. Use appropriate SI units and give answers to the required degree of accuracy.
4. Where a diagram is provided, study it carefully before answering.
5. Draw clear labelled diagrams where required.
6. Use the spaces provided for your answers.

SECTION A — MECHANICS AND THERMAL PHYSICS (30 MARKS)

1. Pressure and its applications are important in everyday life. **(10 marks)**

(a) State two factors that affect pressure in a liquid. **(2 marks)**

(b) A liquid has density 800 kg m^{-3} and a depth of 2.5 m. Calculate the pressure due to the liquid.

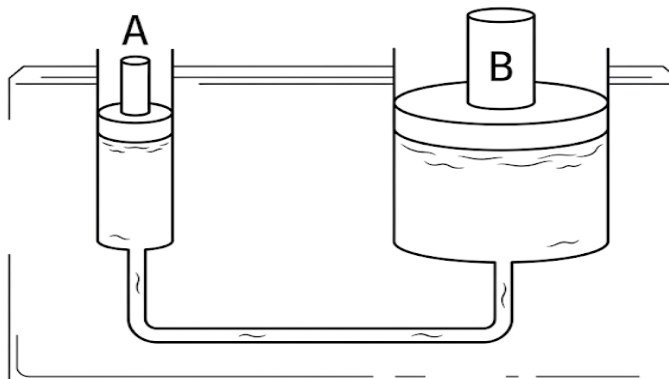
Take $g = 10 \text{ N kg}^{-1}$. **(3 marks)**

(c) Explain two applications of atmospheric pressure in everyday life. **(2 marks)**

(d) Explain why pressure in a liquid increases with depth. **(3 marks)**

2. Study the hydraulic system below. **(10 marks)**

HYDRAULIC SYSTEM



(a) State the principle on which the hydraulic system operates. **(2 marks)**

(b) Explain how a small force applied at A can produce a larger force at B. **(3 marks)**

(c) Give two applications of hydraulic systems. **(2 marks)**

(d) State three safety considerations when using hydraulic equipment. **(3 marks)**

3. Mechanical properties and thermal expansion affect the choice and use of materials. (10 marks)

(a) Define ductility, malleability and elasticity. **(3 marks)**

(b) A wire of cross-sectional area $2.0 \times 10^{-6} \text{ m}^2$ carries a tensile force of 100 N. Calculate its tensile stress. **(2 marks)**

(c) State two applications of thermal expansion in solids.

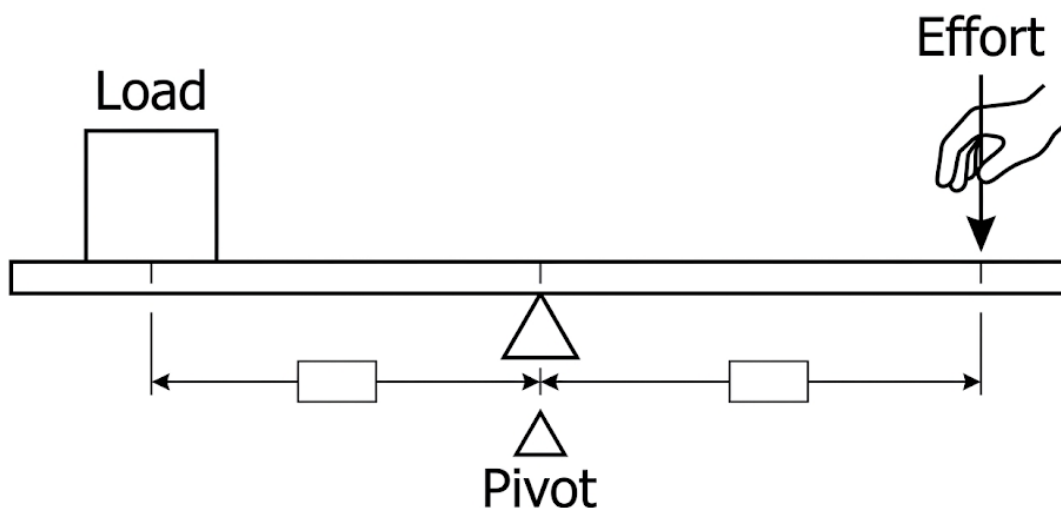
(2 marks)

(d) Explain why a gap is left between sections of railway tracks or bridges.

(3 marks)

SECTION B — MECHANICS, WAVES AND RADIOACTIVITY (30 MARKS)

4. Study the lever diagram below.



(a) State the principle of moments.

(2 marks)

(b) A 40 N load acts 0.20 m from the pivot. Calculate the moment of the load about the pivot.

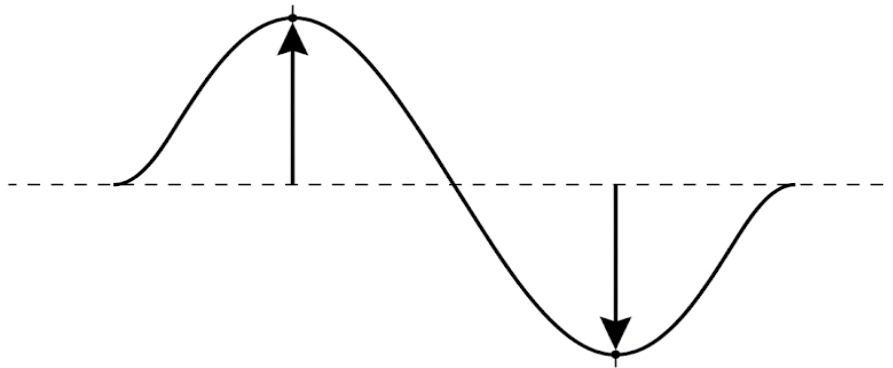
(2 marks)

(c) State two factors that affect the stability of an object.

(2 marks)

(d) Describe how kinetic and potential energy are transformed when a raised object falls. **(4 marks)**

5. Study the wave diagram below.



(a) Name the two measurable quantities indicated by the vertical arrows and the horizontal distance between successive similar points. **(3 marks)**

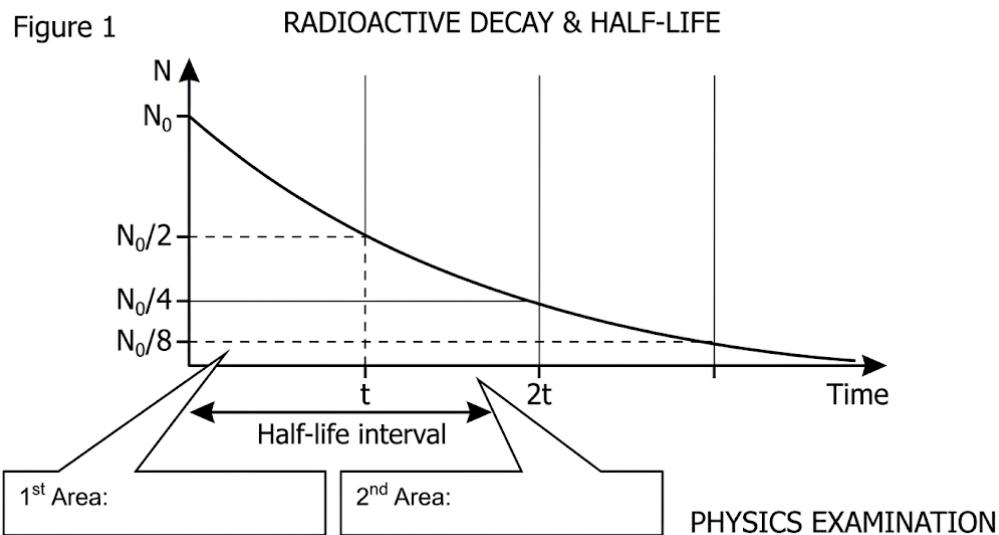
(b) State two properties of waves included in the Grade 10 curriculum.

(2 marks)

(c) Explain the Doppler effect using a moving sound source as an example. (3 marks)

(d) State two applications of stationary waves or resonance. (2 marks)

6. Radioactivity involves unstable nuclei, radiation and safety precautions.



(a) Define half-life. (2 marks)

(b) Describe how the graph can be used to determine the half-life of a radioactive substance. (3 marks)

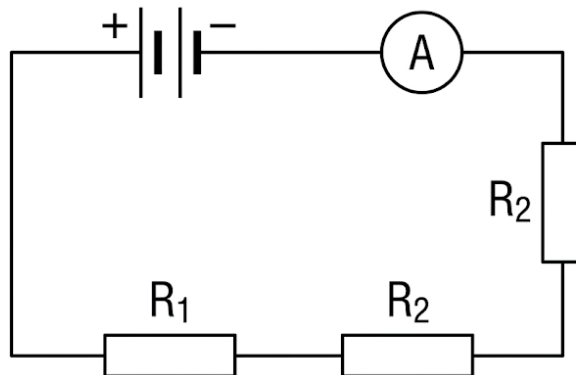
(c) State three safety precautions when handling radioactive substances. (3 marks)

(d) Distinguish between nuclear fission and nuclear fusion. (2 marks)

SECTION C — ELECTRICITY, MAGNETISM AND ENVIRONMENTAL PHYSICS

(20 MARKS)

7. Study the simple circuit below.



(a) State the relationship between current, potential difference and resistance for an ohmic conductor. (2 marks)

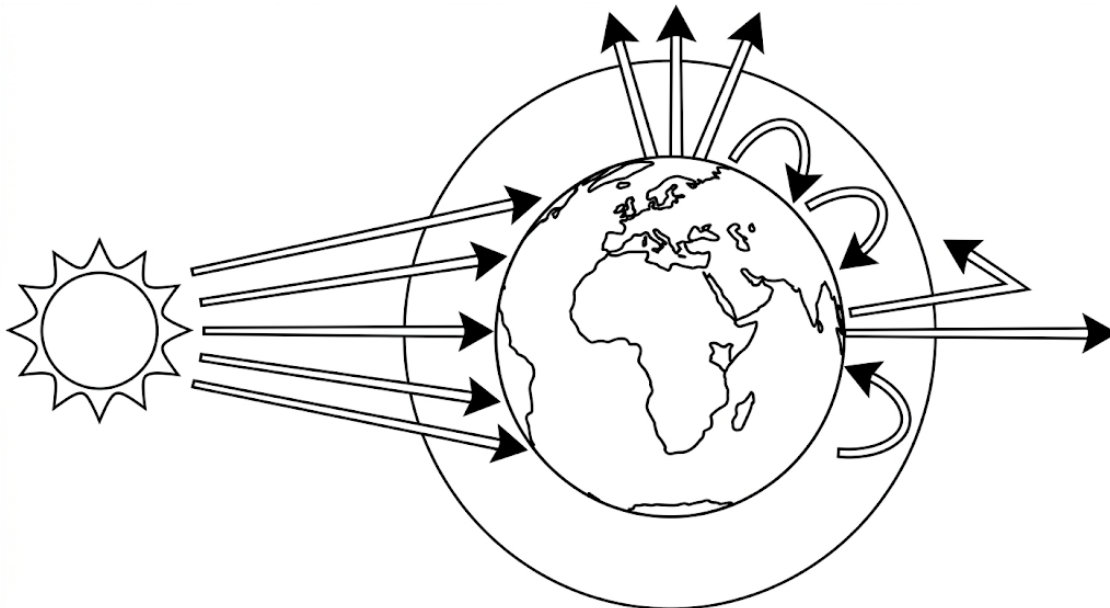
(b) A resistor has a potential difference of 12 V across it and a current of 3 A through it. Calculate its resistance. (2 marks)

(c) State two methods of determining resistance experimentally. (2 marks)

(d) Give two applications or uses of resistors in electrical circuits. (2 marks)

(e) State two electrical safety precautions. (2 marks)

8. Study the greenhouse-effect diagram below. (10 marks)



(a) Explain the greenhouse effect as represented in the diagram. (3 marks)

(b) State two factors that can contribute to climate change. **(2 marks)**

(c) Explain one environmental effect of climate change. **(2 marks)**

(d) State two benefits of space technology or planetary observation to society. **(2 marks)**

(e) Name one career related to space exploration or space flight and state one role associated with it. **(1 marks)**

END OF QUESTION PAPER

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

AGRICULTURE

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

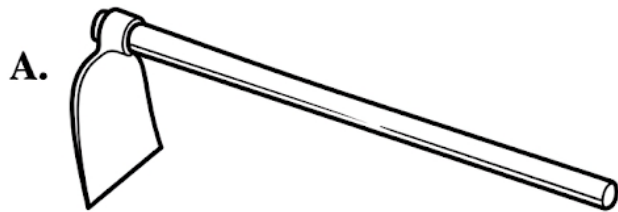
1. Write your name, assessment number, class/stream and date in the spaces provided.
2. Read all questions carefully before answering.
3. Answer ALL questions.
4. Show all working where calculations are required.
5. Use clear and legible handwriting.
6. Where a diagram is required, use clear labels and appropriate proportions.
7. Use the units specified in the question where applicable.
8. Check the question paper to ensure that all pages and questions are present.
9. Answer all questions in English unless otherwise directed by the teacher.

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
A	1–2	20	
B	3–4	30	
C	5–6	30	
TOTAL		80	

SECTION A — AGRICULTURAL TECHNOLOGIES

Answer Questions 1 and 2.



C.

D.

F.

1. Study the agricultural tools represented by the diagram above.

(a) Name the tools labelled A, B, C and D. **(4 marks)**

(b) State one agricultural use of each of the four tools named in (a). **(4 marks)**

(c) State two safety precautions that should be observed when using agricultural tools. **(2 marks)**

2. Agricultural produce may be processed to increase its usefulness and value.

(a) Explain the meaning of value addition in agricultural production. **(2 marks)**

(b) Give three examples of agricultural produce that may be subjected to value addition. **(3 marks)**

(c) State three considerations that should be observed when processing agricultural produce.

(3 marks)

(d) Explain two benefits of processing agricultural produce before it reaches the consumer.

(2 marks)

SECTION B — AGRICULTURAL ENTERPRISE AND MARKETING

Answer Questions 3 and 4.

3. A school agriculture club intends to establish a small vegetable enterprise.

(a) Explain the following factors of production as they apply to an agricultural enterprise: land, labour, capital and entrepreneurship. **(8 marks)**

(b) Describe three ways through which the club could acquire capital to establish the enterprise.

(3 marks)

(c) State four factors that the club should consider when selecting an agricultural enterprise.

(4 marks)

4. A farmer prepares vegetables for sale. During one marketing exercise, the following costs and sales were recorded:

Item	Amount (Ksh)
Transportation	2,500
Advertising	1,000
Market authority charges	500
Taxes	750
Packaging	1,250
Total sales	18,000

(a) State five ways in which agricultural produce can be prepared for marketing. **(5 marks)**

(b) Calculate the total marketing expenses and the net return from the sale. **(4 marks)**

(c) Distinguish between a physical market outlet and a digital market outlet for agricultural produce.
Give one example of each. **(4 marks)**

(d) Explain one importance of properly preparing agricultural produce before marketing it. **(2 marks)**

SECTION C — COMPOSTING AND INTEGRATED APPLICATION

Answer Questions 5 and 6.

5. Composting is one of the techniques used to produce organic manure.

(a) Define compost manure. **(2 marks)**

(b) Describe four factors that influence the quality of compost manure. **(4 marks)**

(c) Describe two methods that may be used to produce compost manure, including one conventional method and one innovative method. **(4 marks)**

(d) State three ways in which composting contributes to soil improvement. **(3 marks)**

(e) State two conditions that should be maintained to support effective decomposition during composting. **(2 marks)**

6. A youth agriculture group has Ksh 20,000 and plans to start a small agricultural enterprise involving crop produce, simple processing and compost production.

(a) State four tools or pieces of equipment the group may require when carrying out agricultural production, processing or related enterprise activities. **(4 marks)**

(b) Outline three steps the group could follow when carrying out value addition on a selected crop product. **(3 marks)**

(c) State three possible ways through which the group could acquire additional capital if the Ksh 20,000 is insufficient. **(3 marks)**

(d) State three market outlets through which the group could sell its agricultural produce. **(3 marks)**

(e) Explain two ways in which the compost produced by the group could support an existing crop enterprise. **(2 marks)**

END OF QUESTION PAPER

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM

SMART-GRADE SERIES - (STEM PATHWAY)

COMMUNITY SERVICE LEARNING

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

1. **Write** your name and assessment details in the spaces provided.
2. **Read** all questions carefully before answering.
3. **Answer** all questions.
4. **Give** clear, relevant and well-organized responses based on Community Service Learning concepts.
5. **Where** a scenario is provided, apply the principles of the curriculum to the situation described.
6. **Use** examples from community contexts where required.
7. **Write** clearly and legibly.
8. **Check** the question paper to ensure that all questions are present.

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
A	1–4	20	
B	5–7	20	
C	8–10	20	

TOTAL: 60 MARKS

SECTION A — ACTION RESEARCH

1. Define action research and state two characteristics that distinguish it from ordinary research.
(4 marks)

2. A Grade 10 class notices that littering around the school gate is increasing. State four reasons why clearly identifying the problem is important before beginning an action research project.
(4 marks)

3. State the four main stages in the action research cycle given in the curriculum and briefly explain what happens at each stage. **(8 marks)**

4. Differentiate between primary and secondary data, then give one suitable example of each that learners could use when investigating a community problem. **(4 marks)**

SECTION B — PROBLEM IDENTIFICATION AND INTERVENTION

5. A school community identifies frequent water wastage as a problem.

(a) State three appropriate data-collection tools that could be used to investigate the problem.

(3 marks)

(b) For each tool, state one type of information it could provide.

(3 marks)

(c) Explain one way of analysing the collected data before deciding on an intervention. **(2 marks)**

6. A learner team has identified poor waste segregation as a community problem. Propose a suitable intervention and prepare an implementation outline showing: the objective, two activities, people responsible, resources required, a time frame, and one indicator that could be used to monitor progress.

(6 marks)

7. Explain three ways reflective meetings can help a team improve an action research intervention while it is being implemented. **(6 marks)**

SECTION C — SOCIAL ENTREPRENEURSHIP

8. Distinguish between social entrepreneurship and an ordinary business enterprise. Give two features of a social enterprise. **(6 marks)**

9. A community has many unemployed young people but also produces a large amount of agricultural waste.

- (a) Identify one viable social enterprise opportunity arising from this situation. **(2 marks)**

- (b) Give three reasons for selecting the opportunity. **(3 marks)**

(c) State one possible social or environmental benefit.

(1 mark)

10. A learner group plans to establish a low-cost social enterprise.

(a) State four major components that should appear in their social enterprise plan. **(4 marks)**

(b) Explain two ways of mobilising resources for the enterprise.

(2 marks)

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

ENGLISH

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

- a) Write your name and assessment details in the spaces provided.*
- b) Answer ALL questions.*
- c) Read all questions and stimuli carefully.*
- d) Where a listening text is provided, follow the teacher's reading instructions.*
- e) Write your answers clearly and use standard English throughout.*
- f) Observe the required format in functional and creative writing tasks.*
- g) Use the spaces provided; continue neatly where necessary.*
- h) Check that all pages and questions are present.*

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
A — Listening & Speaking	1–5	15	
B — Reading	6–10	25	
C — Grammar in Use	11–20	25	
D — Writing	21–24	35	
TOTAL		100	

SECTION A — LISTENING AND SPEAKING (15 MARKS)

The teacher will read the following passage twice. Candidates should listen carefully and answer the questions that follow.

TEACHER'S LISTENING TEXT

At a youth forum on community health and careers, a speaker explained that young people often receive information from many sources at once. Some information is useful, while some may be incomplete or misleading. She advised learners to listen actively, identify the main message, and ask for clarification when a speaker's meaning is unclear. She also reminded them to respect people whose experiences differ from their own. During the discussion, one learner said that artificial intelligence could help hospitals identify illnesses more quickly. Another learner agreed but added that technology should support, rather than replace, responsible human decision-making. The facilitator then asked the group to distinguish facts from opinions. She stated that a hospital may use digital records to store patient information, but the claim that every computer system is always accurate is an opinion that requires evidence. Later, a transport officer announced that a public career exhibition would begin at nine o'clock on Saturday. He asked visitors to filter out unrelated conversations and listen for the names of speakers, venues and times. The forum ended with a reminder that good communication requires turn-taking, polite disagreement, empathy and attention to both spoken words and non-verbal signals.

1. State two techniques the speaker recommended for effective listening. **(2 marks)**

2. Give one fact and one opinion contained in the passage. **(2 marks)**

3. Why should a learner ask for clarification during a conversation? **(2 marks)**

4. State two pieces of specific information a listener should identify from the career exhibition announcement. **(2 marks)**

5. Using the ideas in the passage, explain three ways a learner can demonstrate respectful communication. **(7 marks)**

SECTION B — READING (25 MARKS)

6. Read the following passage and answer the questions that follow. (10 marks)

Every Saturday, Amina visited the community library before joining her friends at the sports ground. One morning she found a notice about a public-sector career forum. The notice explained that the forum would include health workers, engineers, teachers and environmental officers. Amina was interested in several careers, but she knew that choosing a career should involve more than following a friend's preference. She therefore made notes about the qualifications, duties and working environments of different professions. At the forum, one officer explained that successful workers continue learning throughout their careers. Another speaker described a difficult experience in which a team had to solve a problem after an important machine failed. Instead of blaming one another, the team members listened to each other, identified the cause and developed a solution. Amina realised that communication, critical thinking and responsibility could be useful in almost every career. Before leaving, she wrote in her journal that a good career decision should be based on accurate information, personal interests, abilities and realistic opportunities.

(a) Why did Amina make notes about different professions? **(2 marks)**

(b) State two qualities that the team displayed when solving the machine problem. **(2 marks)**

(c) What lesson did Amina draw from the career forum?

(2 marks)

(d) Give the meaning of: (i) qualifications; (ii) realistic.

(2 marks)

(e) In one sentence, summarise the main idea of the passage.

(2 marks)

7. Read the following factual text.

(5 marks)

Public health messages are most effective when they are accurate, clear and directed at a specific audience. A message about road safety, for example, may focus on pedestrians, cyclists, passengers or drivers. A reader should consider the source of a message, identify its purpose and separate evidence from unsupported claims. Reference materials such as dictionaries, manuals, atlases, newspapers and encyclopaedias can help a learner verify unfamiliar information.

(a) State two qualities of an effective public health message.

(2 marks)

(b) Name two reference materials mentioned in the passage.

(2 marks)

(c) Why should a reader consider the source of information?

(1 marks)

8. Study the following notice and answer the questions.

(5 marks)

COMMUNITY CAREER AND HEALTH DAY

Saturday 10 October | 9:00 a.m.–3:00 p.m. | Community Hall

Talks by a nurse, teacher, engineer and environmental officer.

FREE ENTRY. Bring a notebook. Contact: School Office.

(a) State two details that a student would need before attending the event.

(2 marks)

(b) What is the purpose of the notice?

(1 marks)

(c) Suggest two pieces of information that a participant could record during the event for later study.

(2 marks)

9. Explain how a learner can use SQ4R, note-making, paraphrasing and summarising to study a difficult text.

(3 marks)

10. State two strategies that can help a learner understand a text more deeply.

(2 marks)

SECTION C — GRAMMAR IN USE (25 MARKS)

11. Replace the nouns with suitable pronouns: (i) Amina thanked the teacher.

(ii) The players congratulated the players. (2 marks)

12. Use the correct form: (i) The students _____ (write) their reports every Friday. (ii) By tomorrow, the committee _____ (complete) the questionnaire. (2 marks)

13. Rewrite correctly using suitable tense/aspect: (i) She is working yesterday. (ii) They have completed the task before the bell rang. (2 marks)

14. Rewrite using an appropriate adjective or prepositional phrase: (i) The speaker gave a message. (ii) The meeting will be held the hall. (2 marks)

15. Join each pair using the word in brackets: (i) The candidate was prepared. The candidate remained calm. (and) (ii) The report was short. It contained all the important facts. (but) (2 marks)

16. Rewrite using appropriate relative or adverbial clauses: (i) The nurse helped the patient. The patient had fainted. (ii) We stayed indoors. It was raining. (2 marks)

17. Complete using suitable noun clauses beginning with that or what: (i) _____ the team won the match surprised everyone. (ii) I know _____ you need. **(2 marks)**

18. Identify the clause pattern: (i) The students listened. (ii) The teacher gave the class a task. (iii) The coach gave the players advice. **(3 marks)**

19. Rewrite in the passive voice: (i) The committee prepared the report. (ii) The nurse checked the patient. **(2 marks)**

20. Correct the errors: (i) The group of learners are ready. (ii) She gave me many useful informations. (iii) He spoke very careful. **(3 marks)**

SECTION D — WRITING (35 MARKS)

21. Rewrite the paragraph using correct capitalisation and punctuation. Use appropriate commas, quotation marks, a hyphen or dash, and other punctuation where necessary. **(5 marks)**

on saturday the chairperson said our career forum will begin at nine oclock however some students arrived late they explained that the bus was delayed

22. Write an appropriate email to your class teacher apologising for missing a school activity.
Demonstrate suitable format, polite language and netiquette. **(4 marks)**

23. Complete BOTH tasks: (a) Write a brief memo or reminder to Grade 10 learners about a school health and safety activity. (3 marks) (b) Write the opening details of a short incident report about a minor accident at school, including where and when it happened and the key facts. (3 marks)
(6 marks)

[illegible]

24. Complete BOTH parts: (a) Write a well-organised narrative or descriptive paragraph about an important event in a learner's life. Use vivid sensory details and appropriate paragraph structure. (7 marks) (b) Write a persuasive/expository paragraph arguing why young people should use reliable information when making important decisions about health, careers or income. Support your view with relevant reasons. (10 marks) **(17 marks)**

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

Published by Mwalimu Consultancy. Contact 0746-222-000 | 0753-222-000 for Marking Schemes.

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

KISWAHILI - LUGHA

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

MTIHANI JUMUISHI WA MWISHO WA MUHULA WA 3

GREDI YA 10

KISWAHILI — LUGHA

TATHMINI YA JUMLA

MUDA: SAA 2 DAKIKA 30 JUMLA: ALAMA 80

MAAGIZO

- a) Jibu maswali yote.*
- b) Andika kwa lugha fasaha na kwa mwandiko unaosomeka.*
- c) Zingatia maagizo ya kila swali.*
- d) Toa majibu kamili pale ambapo swali linahitaji maelezo.*
- e) Tathmini hii inahusu kwa jumla mada na mada ndogo zote za Muundo wa Mtaala wa Kiswahili Gredi ya 10.*

SEHEMU A: KUSIKILIZA NA KUZUNGUMZA — ALAMA 20

1. Eleza vipengele vinne vya fani vinavyoweza kuzingatiwa unapochambua matini simulizi.

(4 alama)

2. Taja na ueleze kwa ufupi mambo manne yanayozingatiwa katika matamshi bora ili ujumbe wa msemaji ueleweke. **(4 alama)**

3. Eleza kanuni nne za uzungumzaji wa papo kwa papo katika mawasiliano ya kila siku. **(4 alama)**

4. Eleza vipengele vinne vya usikilizaji husishi vinavyomwezesha msikilizaji kuelewa na kuitikia ujumbe ipasavyo. **(4 alama)**

5. Eleza mambo manne ya kuzingatia katika kusikiliza kwa kuhakiki matini ili kutofautisha hoja halisi na taarifa zisizo sahihi. **(4 alama)**

SEHEMU B: KUSOMA — ALAMA 20

6. Soma kifungu hiki kisha ujibu: “Mazingira safi huanza na maamuzi madogo ya kila siku. Mwanafunzi anayepanga taka, kutumia tena vitu vinavyofaa na kuhimiza wenzake kutunza mazingira huchangia afya ya jamii.” Eleza ujumbe mkuu na hoja tatu zinazounga mkono ujumbe huo. **(4 alama)**

7. Eleza hatua nne za kufuata unapofupisha kifungu cha kupasha habari bila kupoteza ujumbe muhimu. **(4 alama)**

8. Eleza mambo manne ya kuzingatia unapochagua na kusoma matini ya kujichagulia kwa mapana. **(4 alama)**

9. Eleza mbinu nne zinazoweza kutumiwa katika usomaji wa kuduhushi ili kupata taarifa mahususi kwa haraka. **(4 alama)**

10. Eleza vipengele vinne vya kusoma kwa ufasaha vinavyopaswa kuzingatiwa wakati wa kusoma kifungu cha maelezo kwa sauti. **(4 alama)**

SEHEMU C: KUANDIKA — ALAMA 20

11. Andika barua ya kirafiki fupi ya kumshauri rafiki yako anayekabiliwa na shinikizo kutoka kwa marafiki kuhusu matumizi mabaya ya muda. Zingatia vipengele vinne muhimu vya barua ya kirafiki. **(4 alama)**

12. Eleza vipengele vinne muhimu vya insha ya wasifu na kisha taja aina ya taarifa zinazofaa kujumuishwa katika wasifu wa mtu. **(4 alama)**

13. Andika notisi fupi ya shule inayowajulisha wanafunzi kuhusu zoezi la usafi wa mazingira litakalofanyika siku ya Ijumaa. Hakikisha notisi yako ina taarifa nne muhimu. **(4 alama)**

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Marking Schemes.

14. Eleza hatua nne za kuhariri matini yako kabla ya kuwasilisha kazi ya mwisho. **(4 alama)**

15. Eleza vipengele vinne muhimu vya kuzingatia unapoandika tafsiri kutoka lugha moja hadi nyingine ili ujumbe wa matini chanzi uhifadhiwe. **(4 alama)**

SEHEMU D: MATUMIZI YA LUGHA — ALAMA 20

16. Tambua aina za maneno katika sentensi hii: “Mwanafunzi mchapakazi alisoma kitabu kizuri kwa makini darasani.” Chagua maneno manne na ueleze aina yake. **(4 alama)**

17. Tunga sentensi moja kwa kila wakati ufuatao: wakati uliopo, wakati uliopita, wakati ujao na wakati uliopo unaoendelea. Tumia vitenzi vinavyofaa. **(4 alama)**

18. Tumia maneno yafuatayo katika sentensi zinazoonyesha kauli husika za vitenzi: kutenda, kutendea, kutendwa na kutendewa. **(4 alama)**

19. Tunga sentensi nne sahihi ukitumia: (a) kinyume cha nomino, (b) kinyume cha kitenzi, (c) kinyume cha kivumishi, na (d) kinyume cha kihusishi. **(4 alama)**

20. (a) Tofautisha sentensi sahili, ambatano na changamano. **(b)** Eleza kwa ufupi maana ya isimujamii na sajili katika matumizi ya lugha. **(4 alama)**

MWISHO WA KARATASI YA MASWALI

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM

SMART-GRADE SERIES - (STEM PATHWAY)

INFORMATION COMMUNICATION TECHNOLOGY

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

- a) Write your name and assessment details in the spaces provided.*
- b) Read all questions carefully before answering.*
- c) Answer ALL questions.*
- d) Show all working where calculations or step-by-step procedures are required.*
- e) Label diagrams, interface components and other visual responses clearly where required.*
- f) Use clear and legible handwriting and appropriate ICT terminology.*
- g) All answers must be written in the spaces provided where applicable.*
- h) Check that all questions and pages are present before handing in the paper.*

EXAMINER'S USE ONLY

Section / Question	Question Numbers	Maximum Score	Candidate's Score
Section A	1–8	20	
Section B	9–12	24	
Section C	13–16	20	
Section D	17–18	16	
TOTAL		80	

SECTION A — FOUNDATIONAL STRUCTURED QUESTIONS (20 MARKS)

1. State four components of ICT infrastructure in an organisation. **(4 marks)**

2. Give two application areas of ICT in society and state one benefit of ICT in each area. **(4 marks)**

3. (a) State two functions of an operating system. (b) Give two examples of operating systems used on digital devices. **(4 marks)**

4. Distinguish between a file and a folder in a computing device. **(2 marks)**

5. State two measures that can be used to protect personal information when using online platforms. **(2 marks)**

6. Give two reasons why digital citizenship is important in society.

(2 marks)

7. State two productivity tools that can be used to produce or present information. **(2 marks)**

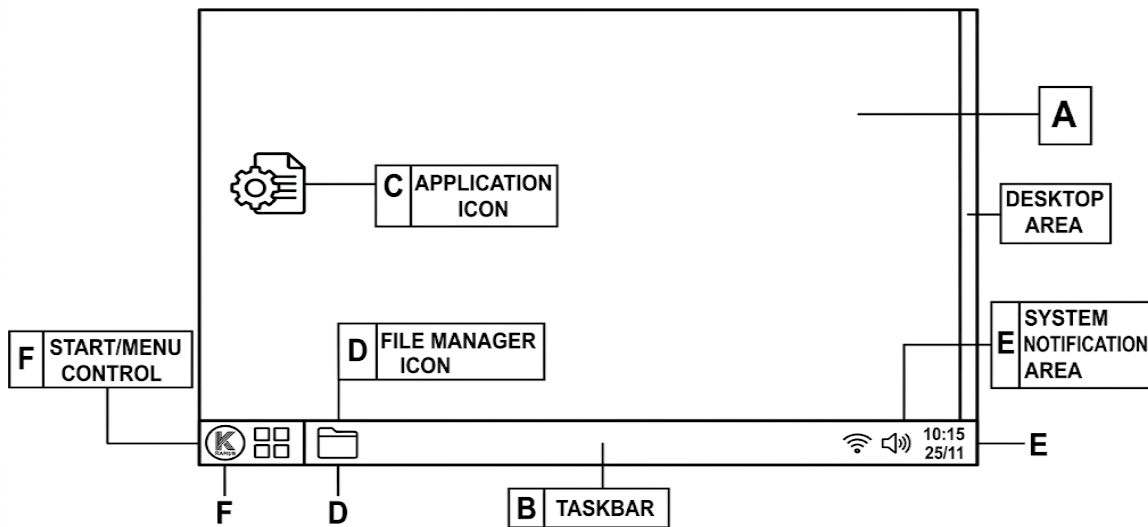
SECTION B — PRODUCTIVITY TOOLS, DATA AND VISUAL REPRESENTATION (24 MARKS)

8. A school is preparing a three-page information leaflet for parents. State four word-processing features that can be used to make the document professional and explain the purpose of each feature. **(8 marks)**

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

9. A learner has prepared a presentation on road safety for a community audience. (a) State two features that can make the presentation interactive and engaging. (b) Explain one way of using hyperlinks or navigation features to improve the presentation. **(5 marks)**

10. Study the simplified desktop interface below and answer the questions that follow. **(5 marks)**



(a) Identify the component that is primarily used to launch applications and access system options. **(1 marks)**

(b) State two functions of a file manager. **(2 marks)**

(c) State two reasons why a graphical user interface can make interaction with an operating system easier. **(2 marks)**

11. Explain three document-production activities that can be improved through collaboration features in a word processor. **(6 marks)**

**SECTION C — INTERNET, DIGITAL CITIZENSHIP AND DIGITAL COMMUNICATION
(20 MARKS)**

12. A learner needs to obtain reliable information from the Internet for a school project. (a) State three services offered through the Internet. (b) Explain three practices that can help the learner obtain reliable information using search engines. **(7 marks)**

13. A school is connecting a computer to the Internet for the first time. State three components or requirements needed to establish an Internet connection and explain the purpose of each.

(6 marks)

14. Read the situation below. A learner receives a message asking for a password and personal details through an unfamiliar online platform. The learner is also considering sharing the message with friends. (a) Identify two online safety risks in the situation. (b) Explain four responsible digital-citizenship actions the learner should take. **(7 marks)**

SECTION D — INTEGRATED APPLICATION AND PROBLEM SOLVING (16 MARKS)

15. A youth group wants to advertise a community health activity using a desktop-publishing tool. Describe four steps the group should follow to create a professional publication and identify one publication type suitable for the activity. **(6 marks)**

16. A community organisation uses e-mail, instant messaging and video conferencing to coordinate activities. Explain four ways digital communication can improve collaboration and identify two precautions that should be observed when sharing files or information online. **(6 marks)**

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM

SMART-GRADE SERIES - (STEM PATHWAY)

PHYSICAL EDUCATION

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

1. Write your name and assessment details in the spaces provided.
2. Read all questions carefully before answering.
3. Answer ALL questions.
4. Use clear and legible handwriting.
5. Where a diagram is provided, study it carefully and respond to the instructions given.
6. Where drawing or labelling is required, make your work clear and accurate.
7. Give practical examples where required.
8. All answers should be written in the spaces provided where applicable.
9. Check that all pages and questions are present before beginning.

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
A	1–3	30	
B	4–6	30	
C	7–8	20	
TOTAL		80	

SECTION A — GAMES (30 MARKS)

1. Football requires coordinated technical skills, teamwork and safe participation.

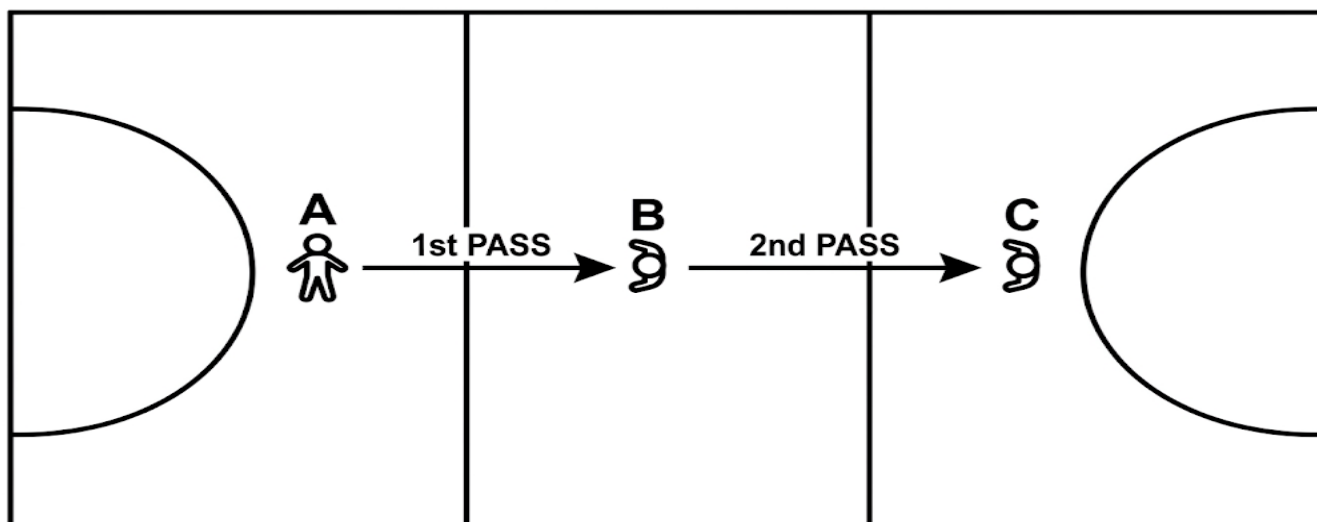
(a) State two correct procedures for restarting play in football. **(2 marks)**

(b) Explain three important coaching points when performing a lofted pass. **(3 marks)**

(c) Describe two ways a defender can use body positioning when marking an opponent. **(2 marks)**

(d) Explain three ways participation in football can contribute to individual wellbeing. **(3 marks)**

2. Study the simplified Netball movement figure below.



(a) Identify the skill sequence represented by the arrows and explain how the movement supports effective passing. **(4 marks)**

(b) State three coaching points for performing a running shot or pass accurately in Netball. **(3 marks)**

(c) Give three benefits of teamwork during a mini Netball game. **(3 marks)**

3. Basketball involves controlled movement, deception and accurate shooting.

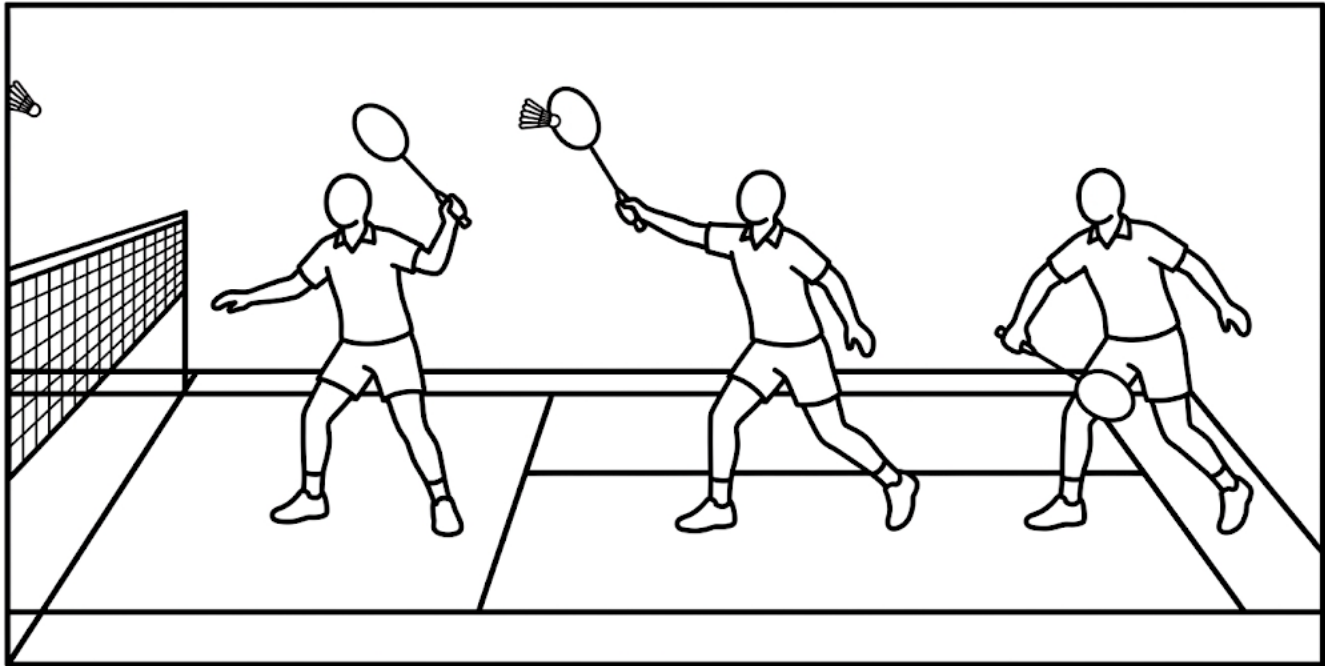
(a) Describe four coaching points for effective crossover dribbling. **(4 marks)**

(b) Explain how faking and feinting can help a player create space for a shot. **(2 marks)**

(c) State two key points for a correct lay-up and two key points for a jump shot. **(4 marks)**

SECTION B — GAMES AND ATHLETICS (30 MARKS)

4. Study the badminton stroke figure below.

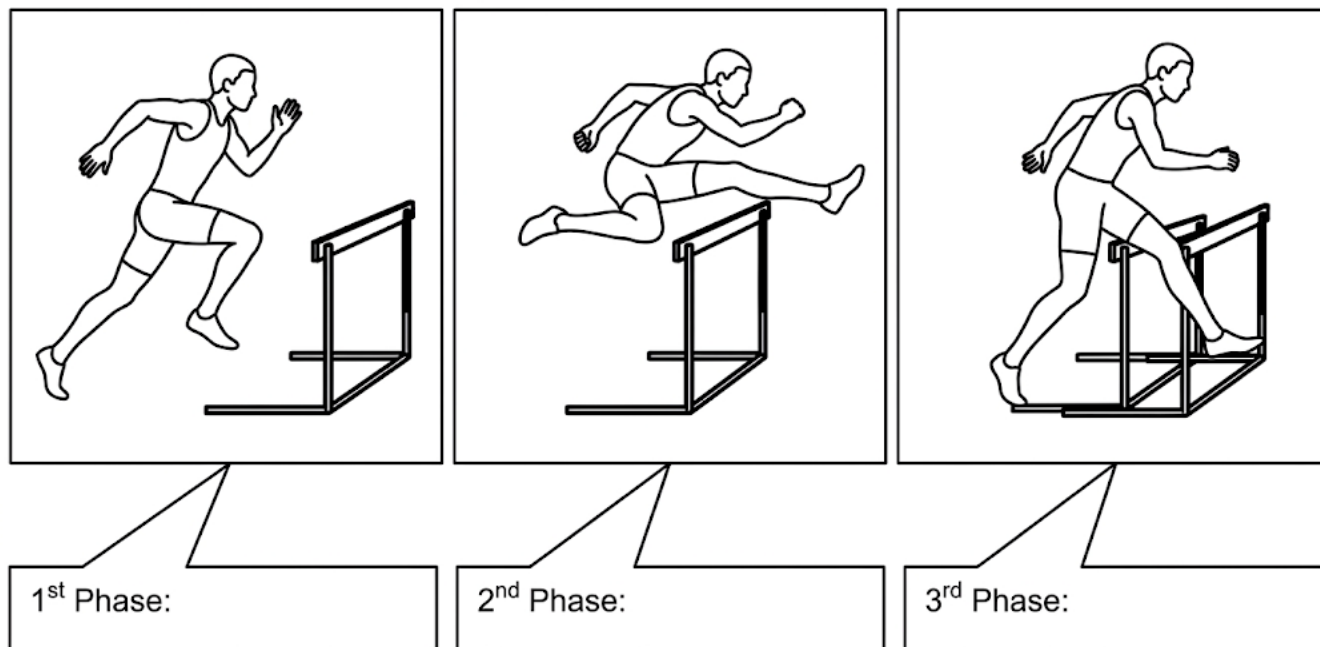


(a) Name the three stages represented in the figure. **(3 marks)**

(b) For any two stages, describe two important technical aspects of grip, stance, swing, contact or follow-through. **(4 marks)**

(c) State three safety or fair-play practices that should be observed during a badminton game. (3 marks)

5. Hurdling requires coordinated technique from the start to recovery.



(a) Identify the three phases shown.

(3 marks)

(b) Explain four safety precautions that should be observed when practising hurdling. (4 marks)

(c) State three ways hurdling can contribute to individual wellness.

(3 marks)

6. Middle-distance running depends on efficient pacing and recovery.

(a) State the three key techniques emphasised in the curriculum for middle-distance races.

(3 marks)

(b) Explain how pacing and breathing contribute to performance in a middle-distance race.

(4 marks)

(c) Give three appropriate recovery practices after a middle-distance race.

(3 marks)

SECTION C — ATHLETICS AND OUTDOOR EDUCATION (20 MARKS)

7. Cross-country running is performed over varied terrain and requires effective management of effort and recovery.

(a) Describe five techniques used in cross-country running, including starting, pacing, terrain management, breathing, finishing or recovery.

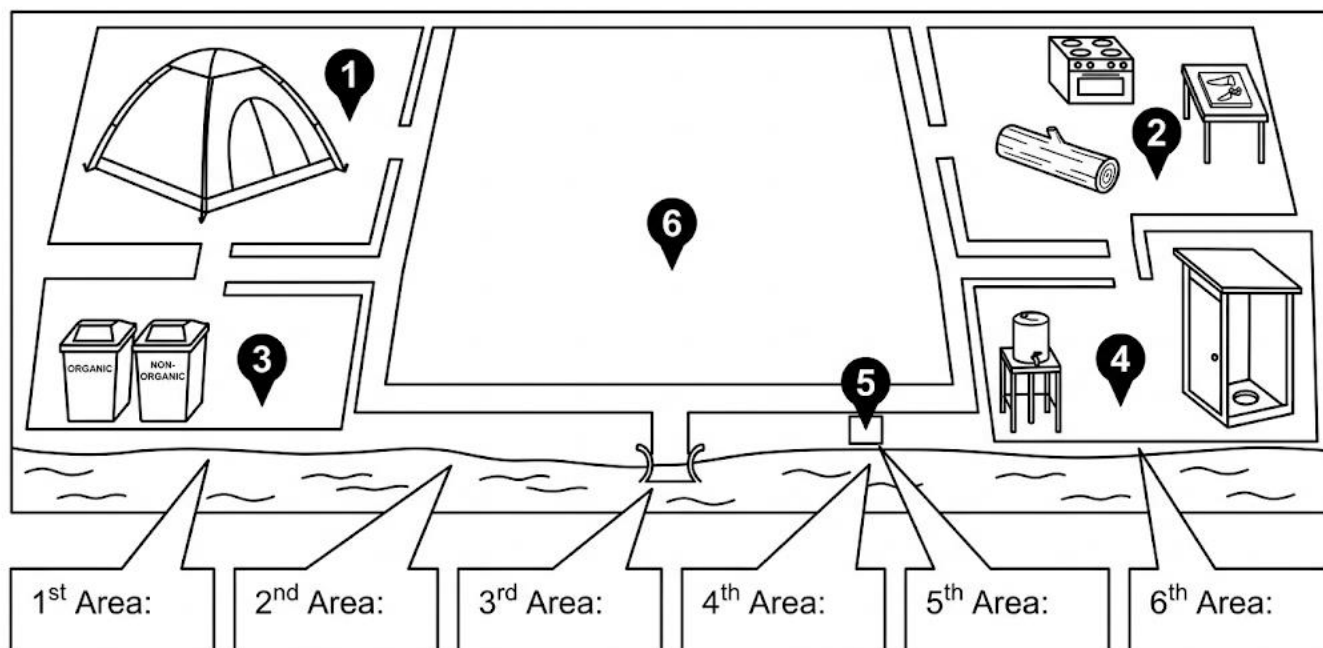
(5 marks)

(b) Explain three ways a learner can maintain safety when running over different terrains. (3 marks)

(c) State two ways cross-country activities can promote environmental awareness. (2 marks)

8. A school is planning a camping adventure. Study the campsite layout below and answer the questions.

CAMPSITE LAYOUT EXERCISE



(a) Identify the six numbered areas in the campsite layout and state one safety consideration for any two of them. **(6 marks)**

(b) State two important considerations when selecting a campsite. **(2 marks)**

(c) Give two examples of responsible activities that may be undertaken during a camping adventure while conserving the environment. **(2 marks)**

END OF QUESTION PAPER- MWALIMU CONSULTANCY LIMITED.

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM

SMART-GRADE SERIES - (STEM PATHWAY)

ESSENTIAL MATHEMATICS

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

Answer ALL questions.

Show all working clearly. Unsupported answers may not earn full marks.

Use a calculator where appropriate.

Give answers to a suitable degree of accuracy where necessary.

Use $\pi = 22/7$ unless otherwise stated.

Draw and label diagrams accurately where required.

All answers must be written in the spaces provided or in the space immediately following each question.

EXAMINER'S USE ONLY

Section	Questions	Maximum Score	Candidate's Score
A	1–5	30	
B	6–10	35	
C	11–15	35	
TOTAL		100	

This is a cumulative assessment of the complete Grade 10 Essential Mathematics Curriculum Design.

SECTION A: NUMBERS AND ALGEBRA

1. (a) Classify each number as rational or irrational: $\sqrt{49}$, $\sqrt{7}$, 0.125 , π . **(4 marks)**

(b) Evaluate: $\frac{3}{4} - \frac{2}{3} \times \frac{9}{8}$. **(3 marks)**

(c) A patient's temperature changes from 38.6°C to 37.2°C . Determine the change in temperature. **(2 marks)**

2. (a) Simplify: $2^3 \times 2^5 \div 2^4$. **(2 marks)**

(b) Express 0.00072 in index form and state the value of its reciprocal. **(3 marks)**

(c) Simplify: $(3^2 \times 3^{-1})^2$.

(3 marks)

3. (a) Factorise completely: $x^2 - 7x + 12$.

(3 marks)

(b) Solve by factorisation: $x^2 - 5x - 14 = 0$.

(4 marks)

(c) The length of a rectangle is 3 m more than its width. Its area is 40 m^2 . Form a quadratic equation and determine its dimensions. **(4 marks)**

4. (a) Two similar containers have corresponding lengths in the ratio 2:5. Determine the ratio of their areas. (2 marks)

- (b) A model is enlarged using a linear scale factor of 3. State the corresponding area scale factor and volume scale factor. (3 marks)

5. A learner's weekly transport expenditure is shown below. (6 marks)

Day	Mon	Tue	Wed	Thu	Fri
Amount (KSh)	20	50	100	80	200

- (a) Calculate the mean daily expenditure. (2 marks)

- (b) If the learner has KSh 1,000 for transport, determine the balance after the five days. (2 marks)

(c) Give one reason why organising and interpreting such data can support decision-making.

(2 marks)

SECTION B: MEASUREMENTS AND GEOMETRY

6. The coordinates of A(2, 3) and B(8, 3) are given. A reflection is made in the y-axis. **(6 marks)**

(a) State the coordinates of A' and B'. **(2 marks)**

(b) Describe the transformation used.

(2 marks)

(c) State the perpendicular distance of A from the mirror line before reflection.

(2 marks)

7. A right-angled triangular field has perpendicular sides 9 m and 12 m.

(7 marks)

(a) Determine the length of the hypotenuse.

(2 marks)

(b) Determine $\sin \theta$, $\cos \theta$ and $\tan \theta$ for the angle opposite the 9 m side.

(3 marks)

(c) A tree is observed from a point on level ground at an angle of elevation of 30° . If the point is 12 m from the foot of the tree, determine the height of the tree.

(2 marks)

8. (a) A triangle has sides 13 cm and 14 cm enclosing an angle of 30° . Determine its area.

(3 marks)

(b) Determine the area of a rhombus whose diagonals are 10 cm and 16 cm.

(2 marks)

(c) A regular hexagon has side length 8 cm. Explain one method that could be used to determine its area.

(2 marks)

9. A circular garden has radius 14 m. (7 marks)

(a) Determine its area. (3 marks)

(b) A sector subtends 90° at the centre. Determine the area of the sector. (2 marks)

(c) Determine the area of the corresponding segment if the triangle formed by the two radii and chord has area 98 m^2 . (2 marks)

10. (a) A cuboid measures 8 cm by 5 cm by 3 cm. Determine its total surface area. (3 marks)

(b) A cone has radius 7 cm and height 24 cm. Determine its volume. (3 marks)

(c) A container is in the shape of a frustum. State the information required to calculate its volume. **(1 marks)**

SECTION C: VOLUME, COMMERCIAL ARITHMETIC, STATISTICS AND PROBABILITY

11. A cylindrical water tank has radius 1.4 m and height 2.5 m. **(6 marks)**

(a) Calculate its capacity in cubic metres. **(3 marks)**

(b) Convert the capacity to litres. **(1 marks)**

(c) If the tank is 80% full, determine the volume of water in it. **(2 marks)**

12. A trader buys goods for KSh 24,000. The goods are sold at a profit of 15%. **(7 marks)**

(a) Determine the profit. **(2 marks)**

(b) Determine the selling price. **(2 marks)**

(c) A customer is given a 10% discount on the selling price. Determine the amount paid by the customer. **(3 marks)**

13. The numbers of books read by 12 learners in a month are: 2, 4, 3, 5, 2, 6, 4, 3, 2, 5, 4, 8.
(8 marks)

(a) Prepare a frequency distribution table. **(3 marks)**

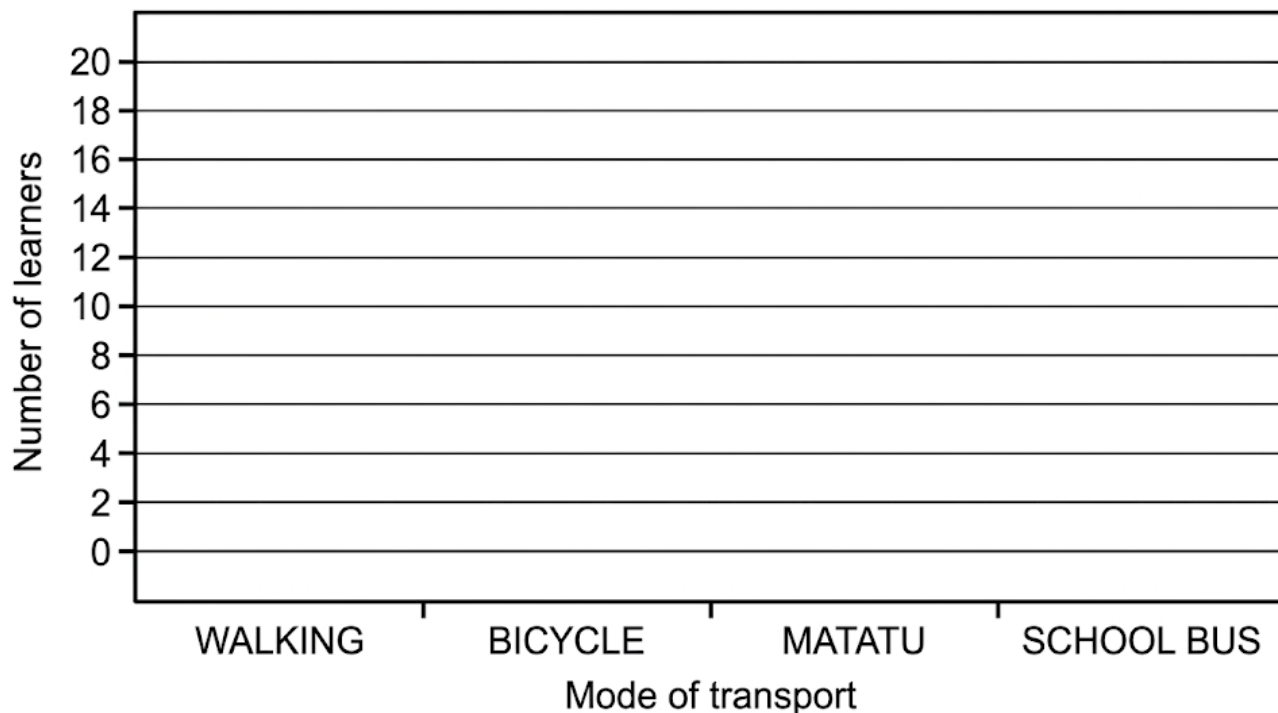
(b) Determine the mode and median. **(3 marks)**

(c) State one conclusion that can be made from the data. **(2 marks)**

- 14. The** following data show the number of learners using different modes of transport to school.
(6 marks)

Mode	Walking	Bicycle	Matatu	School bus
Number of learners	2	3	20	10

- (a) Draw a suitable bar graph to represent the data. (3 marks)



- (b) State which mode is most common and give the number of learners using it. (2 marks)

- (c) Give one reason why a graph can be useful when interpreting data. (1 marks)

- 15. (a) A** fair die is rolled once. Determine the probability of obtaining an even number. (2 marks)

(b) A bag contains 4 red balls and 6 blue balls. One ball is selected at random. Determine the probability of selecting a red ball. **(2 marks)**

(c) A coin is tossed and a die is rolled. Determine the probability of obtaining a head and a six. **(3 marks)**

(d) Explain why understanding probability can help a person make responsible decisions in real-life situations. **(3 marks)**

END OF QUESTION PAPER -0746222000

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM

SMART-GRADE SERIES - (STEM PATHWAY)

CORE MATHEMATICS

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

Answer ALL questions.

This is a cumulative assessment of the Grade 10 Core Mathematics Curriculum Design.

Show all working clearly. Full working is required for questions involving calculations.

Use a calculator where appropriate.

Give answers to a suitable degree of accuracy where necessary.

Use $\pi = 22/7$ unless otherwise stated.

EXAMINER'S USE ONLY

Section	Questions	Maximum Score	Score
A	1–2	20	
B	3–8	60	
C	9–12	20	
TOTAL		100	

SECTION A: NUMBERS AND ALGEBRA

1. (a) Classify $\sqrt{49}$, $\sqrt{7}$, 0.125 and π as rational or irrational.

(4 marks)

(b) Find the reciprocal of $5/8$.

(2 marks)

(c) Evaluate $2^3 \times 2^{-1} \div 2^2$.

(2 marks)

(d) Find $\log_{10} 1000$.

(2 marks)

2. (a) Factorise $x^2 - 9x + 20$. **(3 marks)**

(b) Solve $x^2 - 7x + 12 = 0$ by factorisation.

(4 marks)

(c) A rectangle has area 48 m^2 and length 2 m more than its width. Form a quadratic equation and determine its dimensions.

(3 marks)

SECTION B: MEASUREMENTS AND GEOMETRY

3. (a) Similar figures have corresponding lengths in the ratio 2:5. Find the ratio of their areas and volumes.

(4 marks)

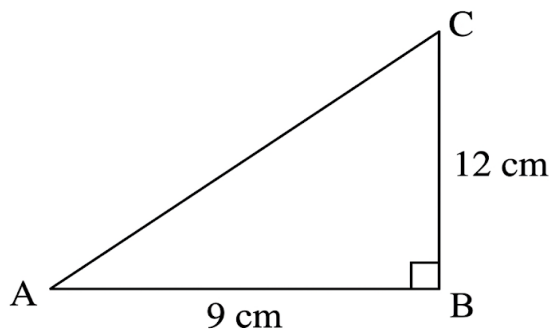
(b) Reflect $A(3,2)$ in the y-axis and state A' .

(2 marks)

(c) State the coordinate rule for a 90° anticlockwise rotation about the origin. **(2 marks)**

4. A vector is $(6,8)$. (a) Find its magnitude. (b) If $u=(2,-1)$ and $v=(4,3)$, find $u+v$. (c) State the translation represented by $(-3,5)$. **(6 marks)**

5. Study the figure below and answer questions that follow.



(a) Find the hypotenuse. **(2 marks)**

(2 marks)

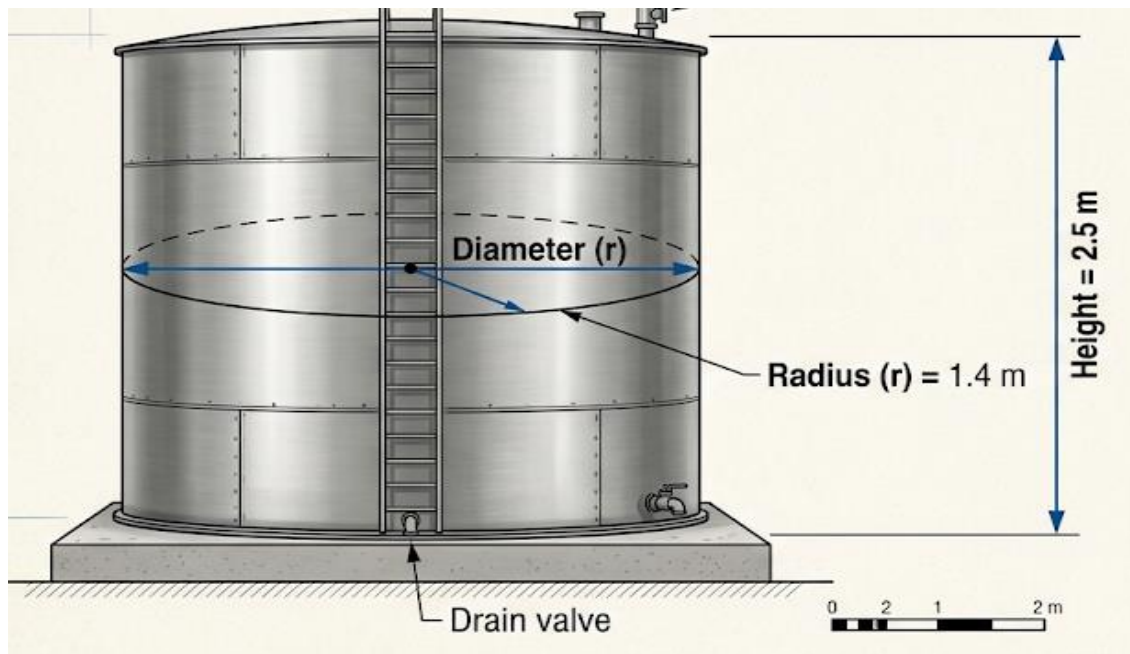
(3 marks)

(8 marks)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

7. (a) Study the figure below. Find its volume.

(2 marks)



(b) A cuboid is $8\text{ cm} \times 5\text{ cm} \times 3\text{ cm}$. Find its total surface area.

(2 marks)

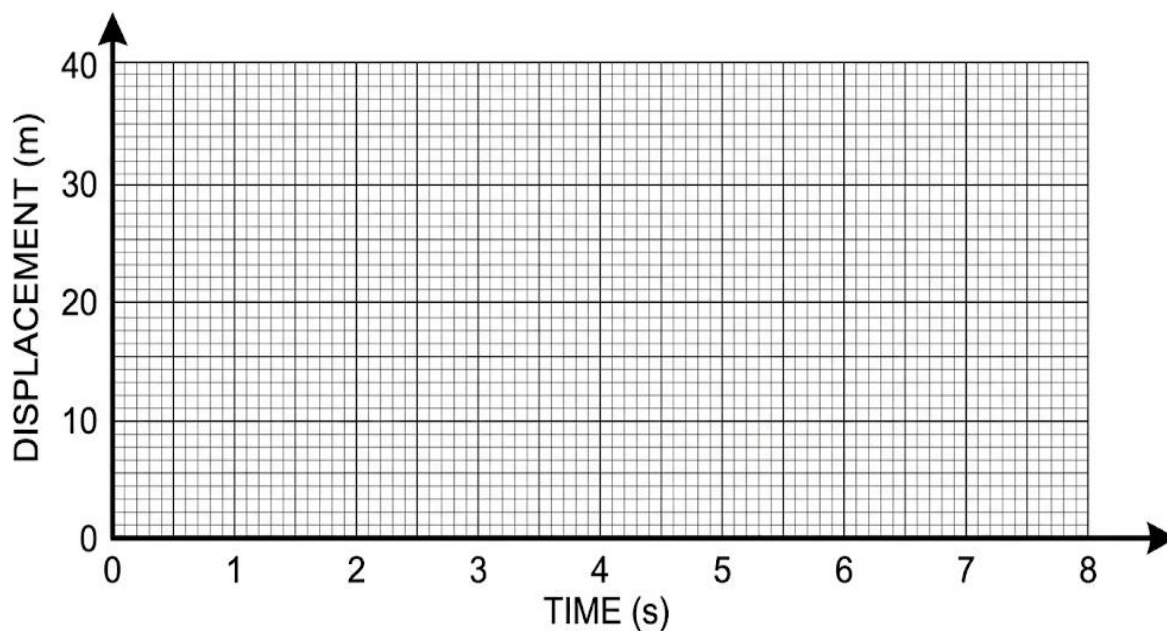
(c) State the information needed to calculate the volume of a frustum.

(3 marks)

8. A car has the following displacement-time data. (8 marks)

Time (s)	0	2	4	6	8
Displacement (m)	0	10	20	30	40

(a) Plot a displacement-time graph.



(b) Determine the speed represented by the graph.

(2 marks)

(c) A second car travels at 8 m/s in the same direction. Find the relative speed.

(3 marks)

SECTION C: STATISTICS AND PROBABILITY

9. The numbers of books read by 12 learners are 2, 4, 3, 5, 2, 6, 4, 3, 2, 5, 4, 8. (a) Prepare a frequency table. (b) Find the mean, mode and median. **(8 marks)**

10. Test scores are grouped as follows. **(8 marks)**

Score	0–9	10–19	20–29	30–39	40–49
Frequency	3	7	12	6	2

(a) State the modal class. **(2 marks)**

(b) Find the total frequency. **(2 marks)**

(c) Explain two differences between a histogram and a frequency polygon.

(4 marks)

11. A bag contains 4 red, 3 blue and 3 green balls. (a) Find $P(\text{red})$. (b) Find $P(\text{blue or green})$. (c) A fair die and fair coin are used. Find $P(\text{six and head})$. (d) State the range of probability. **(8 marks)**

This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for writing. There are no margins, text, or other markings on the page.

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Marking Schemes.

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

COMPUTER STUDIES

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

- a) Write your name and assessment details in the spaces provided.
- b) Answer ALL questions.
- c) Read each question carefully before answering.
- d) Show all working where calculations are required.
- e) Label diagrams clearly where required.
- f) Use appropriate units where applicable.
- g) Write answers in the spaces provided.
- h) Use clear and legible handwriting.
- i) Check that all pages and questions are present.

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
A	1–10	20	
B	11–15	40	
C	16–19	40	

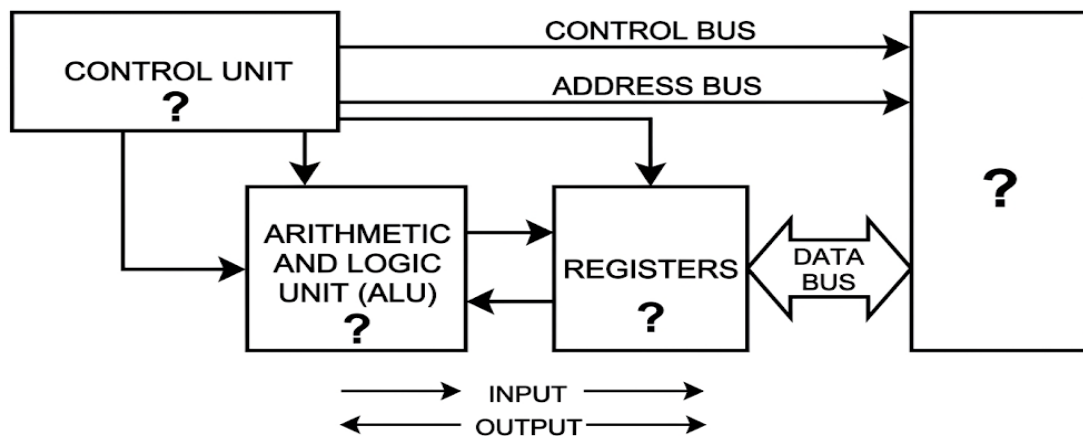
SECTION A — FOUNDATIONAL STRUCTURED QUESTIONS

Answer ALL questions in this section. (20 marks)

1. State two technological developments that distinguished an early generation of computers from a later generation. **(2 marks)**

2. Name two functional units shown in the diagram below and state one role of each. **(2 marks)**

SIMPLIFIED CPU FUNCTIONAL DIAGRAM



3. Give one example of an input device and one example of an output device. State one criterion used when selecting an input or output device. **(2 marks)**

4. Distinguish between primary storage and secondary storage, giving one example of each.

(2 marks)

5. State two factors that may be considered when selecting a CPU for a computer. (2 marks)

6. State two functions performed by an operating system. (2 marks)

7. State two safety precautions that should be observed when setting up a computer. (2 marks)

8. Differentiate between analogue data and digital data in data communication. (2 marks)

9. Name two components/elements required to form a computer network. (2 marks)

10. State two rules that should be observed when choosing identifiers in a programming language. (2 marks)

SECTION B — APPLICATION, DATA, DIAGRAMS AND PROBLEM SOLVING

Answer ALL questions in this section. (40 marks)

11. A school has acquired computers of different generations.

(a) Explain two major technological changes that occurred as computers evolved, and relate each change to improved computer performance or capability. (4 marks)

(b) Explain the fetch-decode-execute cycle and state the role of the Control Unit in the cycle.

(4 marks)

12. A learner wants to purchase devices and storage media for a computer laboratory.

(a) Explain two factors that should guide the selection of input/output devices for the laboratory.

(4 marks)

(b) Recommend one suitable primary storage technology and two suitable secondary storage media, giving one reason for each choice.

(4 marks)

13. A school is preparing computers for a new laboratory.

(a) Explain two functions of an operating system that would be important in the laboratory.

(2 marks)

(b) Describe two structural elements of a CPU and state the role of each.

(4 marks)

(c) State two precautions to observe when connecting cables and ports during computer setup. (2 marks)

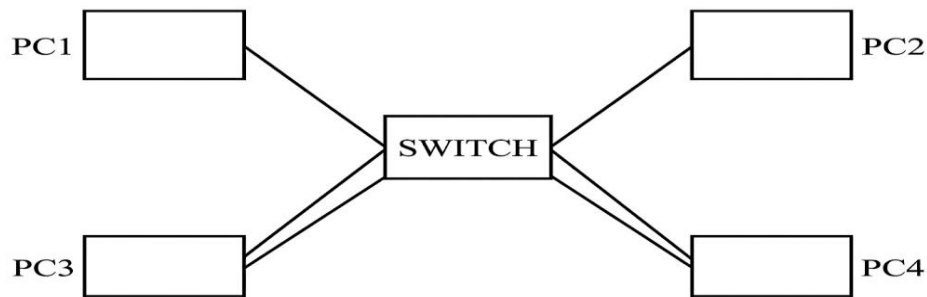
14. A computer network is being installed between two offices.

(a) Explain the following data-communication concepts: sender, message, medium and receiver. (4 marks)

(b) Distinguish between simplex and full-duplex communication. (2 marks)

(c) State two types of transmission media used in computer networks. (2 marks)

15. A school wants a network that connects several computers to a central switch. Use the diagram below.



(a) Identify the network topology shown. (2 marks)

(b) State two advantages of the topology shown. (4 marks)

- (c) Name two devices/components, other than the computers, that may be used when establishing a computer network. (2 marks)

SECTION C — EXTENDED STRUCTURED APPLICATION

Answer ALL questions in this section. (40 marks)

16. A learner is developing a simple program to determine whether a traffic-light instruction should allow a vehicle to proceed.

- (a) Explain the stages of the program development process from problem definition to maintenance. (4 marks)

- (b) Write a pseudocode algorithm that accepts a traffic-light colour and displays an appropriate instruction for RED, YELLOW or GREEN. (4 marks)

- (c) State one reason why algorithms are important in problem solving. (2 marks)

17. A programming learner writes a program that accepts two numbers and performs an operation selected by the user.

- (a) Differentiate between an identifier, a variable and a constant. (3 marks)

(b) Explain three categories of programming operators and give one example of each. **(3 marks)**

(c) Write a suitable programming statement/pseudocode instruction that accepts two numbers, adds them and displays the result. **(2 marks)**

(d) Explain how a selection control structure can be used to choose an operation based on the user's choice. **(2 marks)**

18. A school records the names of learners using a program.

(a) Distinguish between a list/array and a dictionary as data structures. **(4 marks)**

(b) Write a short pseudocode example showing how a collection of three learner names can be stored and accessed. **(3 marks)**

(c) State three reasons why data structures are important in programming. **(3 marks)**

19. A teacher wants to avoid repeating the same calculation in several parts of a program.

(a) Explain what a function is and state two benefits of using functions in programming. **(4 marks)**

(b) Distinguish between a parameter and an argument. **(2 marks)**

(c) Write pseudocode for a user-defined function named `calculate_area` that accepts length and width and returns the area of a rectangle. Show how the function is called. **(4 marks)**

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

GENERAL SCIENCE

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

- a) Write your name and assessment details in the spaces provided.*
- b) This paper contains structured-response questions only. Answer all questions.*
- c) Read each question carefully before answering.*
- d) Show all working where calculations are required.*
- e) Give units for numerical answers where applicable.*
- f) Draw and label diagrams clearly where required.*
- g) Use the spaces provided and write clearly and legibly.*
- h) All questions carry the marks indicated.*
- i) Check that all pages and questions are present before handing in your paper.*

TOTAL: 100 MARKS

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
A	1–10	20	
B	11–15	40	
C	16–19	40	
TOTAL		100	

SECTION A — FOUNDATIONAL STRUCTURED QUESTIONS (20 marks)

1. State two reasons why General Science is important in everyday life. (2 marks)

2. Distinguish between a light microscope and an electron microscope. (2 marks)

3. State two adaptations of the human digestive system that enable efficient digestion and absorption of food. (2 marks)

4. Differentiate between aerobic and anaerobic respiration. (2 marks)

5. State two factors necessary for seed germination. (2 marks)

6. State two methods of preventing the transmission of microorganisms that cause infections in human beings. (2 marks)

7. Write the electron arrangement of: (a) sodium, Na; (b) chlorine, Cl. **(2 marks)**

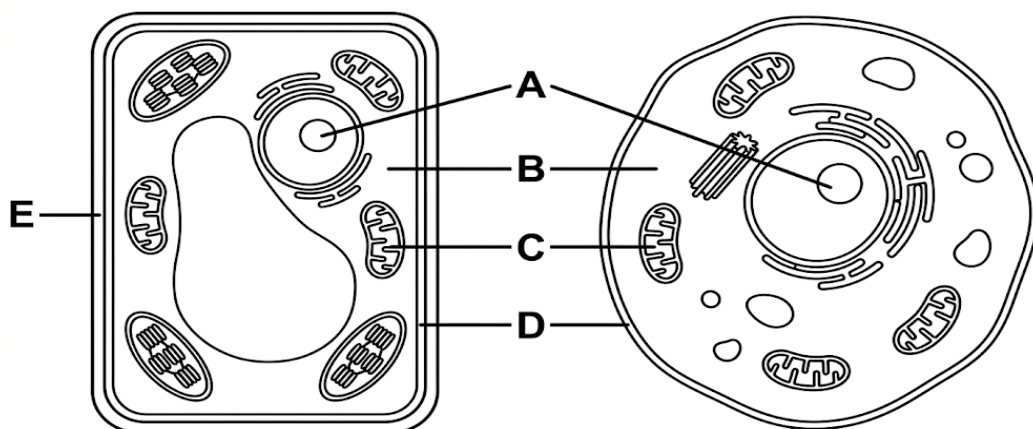
8. State two differences between ionic bonding and covalent bonding. **(2 marks)**

9. State two factors that affect the rate of a chemical reaction. **(2 marks)**

10. Define: (a) moment of a force about a point; (b) wavelength. **(2 marks)**

SECTION B — APPLICATION, DATA, DIAGRAMS AND PROBLEM SOLVING
(40 marks)

11. Study the diagram below and answer the questions that follow.



(a) Name the structures labelled A, B and C.

(3 marks)

(b) State one function of each of the three structures named in (a).

(3 marks)

(c) State one difference between the organization of a cell and that of an organ system. **(2 marks)**

(d) Explain why the cell is regarded as the basic unit of life.

(2 marks)

12. A learner carried out food tests on a sample of food and obtained the observations shown below.

Test	Observation
Benedict's solution + heating	Blue solution changed to orange-red
Iodine solution	No blue-black colour
Biuret test	Violet colour formed

(a) Identify the food substances indicated by the Benedict's and Biuret tests.

(2 marks)

(b) Explain the role of enzymes in the digestion of food.

(3 marks)

(c) Explain how the structure of the small intestine is adapted for absorption of digested food.

(3 marks)

13. A farmer investigates water loss from leaves. Four similar potted plants are placed under different conditions. The percentage mass loss after a fixed period is recorded as follows.

Plant	Condition	Percentage mass loss
A	Well-watered, exposed to moving air	18%
B	Well-watered, sheltered from moving air	11%
C	Well-watered, high humidity	6%
D	Well-watered, leaves partly covered	8%

(a) Identify the process responsible for the loss of water from the leaves.

(1 marks)

(b) Using the data, explain the effect of moving air on the rate of water loss.

(2 marks)

(c) State two factors, other than moving air, that can affect transpiration. (2 marks)

(d) Explain why transport of water and mineral salts is important to plant growth. (3 marks)

14. The first twenty elements of the periodic table are arranged according to increasing atomic number.

	I	II				VII	VIII
1	1 H Hydrogen 1.0						
2	3 Li Lithium 6.9	4 Be Beryllium 9.0				9 F Fluorine 19.0	10 Ne Neon 20.2
3	11 Na Sodium 23.0	X	B B Alum 13.7	C N Alrine 15.6	O O O 16.0	17 Cl Chlorine 35.5	18 Ar Argon 39.9
4	19 K Potassium 39.1	20 Ca Calcium 40.1	13 Mg Album 99.2	14 Si Si 101.3	16 P S 113.3	Y	Z

(a) State the group and period occupied by an element whose electron arrangement is 2,8,1.

(2 marks)

(b) Explain why elements in the same group of the periodic table have similar chemical properties.

(2 marks)

(c) Write the chemical formula of aluminium oxide using the valencies of aluminium and oxygen.

(2 marks)

(d) State two uses of elements or their compounds from the periodic table in everyday life.

(2 marks)

15. A student investigates the rate of reaction between a solid and an acid. The student repeats the experiment at different temperatures while keeping other conditions constant.

(a) State the independent variable and one controlled variable in the investigation. **(2 marks)**

(b) Describe how increasing temperature generally affects the rate of a chemical reaction.

(2 marks)

(c) Give two other factors that can affect the rate of a chemical reaction.

(2 marks)

(d) Explain why safety precautions are necessary when investigating rates of chemical reactions.

(2 marks)

SECTION C — EXTENDED STRUCTURED APPLICATION (40 marks)

16. A student balances a metre rule on a pivot. A force of 4 N acts at a distance of 0.50 m from the pivot. A second force is applied on the opposite side at a distance of 0.25 m.

(a) Calculate the moment produced by the 4 N force about the pivot. **(3 marks)**

(b) Calculate the magnitude of the second force required to balance the metre rule. **(3 marks)**

(c) State two applications of the turning effect of force in real life. **(2 marks)**

(d) Explain why a long spanner is generally more effective than a short spanner when loosening a tight nut. **(2 marks)**

17. A ball is dropped from a height. Its motion is observed as it falls towards the ground.

(a) Define acceleration and state the direction of acceleration of a freely falling body near the Earth's surface. **(2 marks)**

(b) A body starts from rest and accelerates uniformly at 2 m/s^2 for 5 s. Calculate its final velocity.

(3 marks)

(c) Explain two safety measures that can reduce injuries associated with falling objects or falls.

(2 marks)

(d) Distinguish between distance and displacement.

(2 marks)

(e) State one example of linear motion with constant acceleration in real life.

(1 marks)

18. A wave has a frequency of 5 Hz and a wavelength of 0.8 m.

(a) Calculate the speed of the wave.

(3 marks)

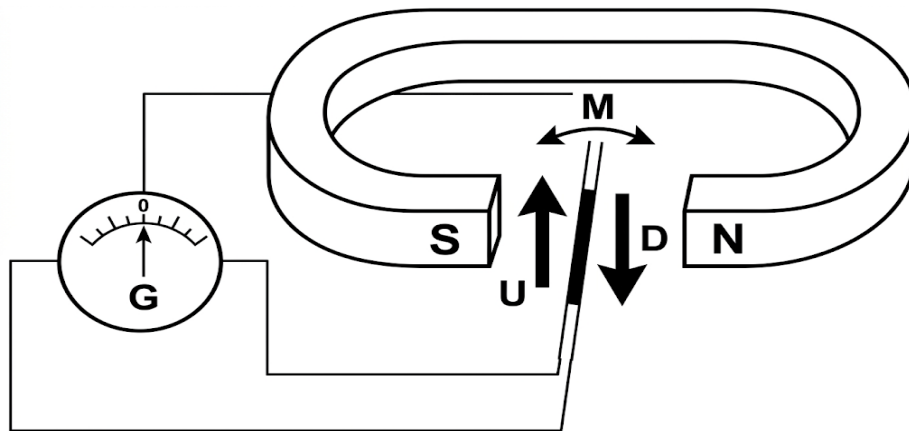
(b) State two properties of waves.

(2 marks)

(c) Explain one application of reflection, refraction or diffraction of waves in real life. **(2 marks)**

(d) Explain one way in which waves can affect the environment and state one mitigation measure. **(3 marks)**

19. Study the electromagnetic induction arrangement shown below.



(a) State what is observed on the galvanometer when the conductor is moved through the magnetic field. **(2 marks)**

(b) Explain how the magnitude of the induced electromotive force can be increased. **(3 marks)**

(c) Describe how a simple electromagnet can be made stronger. **(2 marks)**

(d) State two applications of electromagnetic induction in everyday life. **(2 marks)**

(e) State one safety or responsibility consideration when carrying out an electromagnetic induction experiment. **(1 marks)**

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

HOME-SCIENCE

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS

- Answer all questions.
- Write clearly and use relevant Home Science terminology.
- Where a question asks for explanations, develop each point clearly.
- Observe all safety requirements in practical situations.

SECTION A — SHORT STRUCTURED QUESTIONS

Answer all questions.

1. Define a balanced diet and state two characteristics of a balanced diet. (2 marks)

2. State two functions of proteins in the body. (2 marks)

3. Give two factors that should be considered when planning family meals. (2 marks)

4. State two safe practices when storing cooked food. (2 marks)

5. Give two ways of conserving water in the home. (2 marks)

6. State two principles of effective household budgeting. (2 marks)

7. Give two ways of maintaining hygiene in the kitchen. (2 marks)

8. Differentiate between natural and synthetic textile fibres. (2 marks)

9. State two examples of natural textile fibres named in the Grade 10 Home Science Curriculum Design. (2 marks)

10. State two safety precautions when handling sewing tools and equipment. (2 marks)

SECTION B — APPLICATION AND SOURCE-BASED QUESTIONS

Answer all questions.

11. Study the situation below and answer the questions that follow.

FAMILY FOOD CHOICE
A family has limited income but wants meals that provide adequate nutrients. The household also wants to reduce food waste, practise safe food handling and make economical use of available resources.

(a) Explain two principles the family should apply when planning nutritious meals on a limited budget. **(4 marks)**

(b) Explain two measures that can reduce food waste in the household. **(4 marks)**

12. A learner is preparing a Home Science practical activity involving textile fibres and sewing.

(a) Explain two methods that may be used to identify natural textile fibres. **(4 marks)**

(b) Explain two safety precautions when using sewing tools and equipment. (4 marks)

13. Study the household-resource situation below.

HOUSEHOLD MANAGEMENT
A household must allocate income to food, clothing, education, housing, transport, health and savings. The family also wants to reduce unnecessary expenditure and use resources sustainably.

(a) Explain three factors that should guide household expenditure decisions. (6 marks)

(b) Explain two ways of conserving household resources. (4 marks)

14. Answer the following questions on food, nutrition and health.

(a) Explain two effects of poor nutrition on an individual's wellbeing. **(4 marks)**

(b) Explain two practices that promote food hygiene and safety. **(4 marks)**

15. Answer the following questions on clothing and textiles.

(a) Explain two differences between woven, knitted and crocheted textile constructions. **(4 marks)**

(b) Explain two ways in which textile knowledge can contribute to creativity or income generation.
(4 marks)

SECTION C — EXTENDED APPLICATION

Answer all questions.

16. A household wants to improve the quality of life of its members while making efficient use of limited resources.

(a) Explain four principles of effective home management that the household should apply.

(8 marks)

(b) Explain two ways in which planning and budgeting can improve household wellbeing.

(4 marks)

17. Nutrition decisions affect individual and family health.

(a) Explain four factors that influence food choices and meal planning. **(8 marks)**

(b) Suggest two measures that can promote healthy and safe eating habits in a family. **(4 marks)**

18. Clothing construction requires appropriate fibres, tools, equipment, skills and safety practices.

The Curriculum Design also identifies realia such as cotton, linen, wool, silk, sisal, bamboo, hyacinth and banana, as well as staple and filament yarns.

(a) Explain four considerations when selecting textile fibres or fabrics for a clothing item.

(8 marks)

(b) Explain two reasons for observing safety when handling sewing tools and equipment. **(4 marks)**

19. Home Science can contribute to sustainable living, creativity and self-reliance.

(a) Explain three ways Home Science skills can support self-reliance and income generation.

(6 marks)

(b) Explain two ways households can practise sustainable use of resources.

(4 marks)

END OF QUESTION PAPER

Compiled by Mwalimu Consultancy Limited.

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

AVIATION

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

1. Write your name and assessment details in the spaces provided.
2. Read all questions carefully before answering.
3. Answer all questions.
4. Show clear working where calculations or reasoning are required.
5. Label diagrams clearly where required.
6. Use appropriate aviation terminology in your responses.
7. Write all answers in the spaces provided where applicable.
8. Use clear and legible handwriting.
9. Check the question paper to ensure that all pages and questions are present.
10. Answer the paper in English.

EXAMINER'S USE ONLY

Section / Question Numbers	Maximum Score	Candidate's Score	Examiner's Initials
Section A — Questions 1–5	20		
Section B — Questions 6–9	20		
Section C — Questions 10–13	20		
Section D — Questions 14–19	20		
TOTAL	80		

SECTION A — AVIATION WEATHER

1. State four elements of weather that are relevant to flight operations. **(4 marks)**

2. Explain four ways in which weather conditions can affect an aircraft in flight. **(4 marks)**

3. Distinguish between cirrus, stratus and cumulus clouds in terms of their general appearance and altitude characteristics. **(6 marks)**

4. A pilot is preparing for a flight and receives information indicating strong winds, high humidity, heavy precipitation and reduced visibility. Explain two operational concerns associated with the reported conditions. **(4 marks)**

5. Explain two reasons why accurate measurement and observation of weather elements are important in flight operations. **(2 marks)**

SECTION B — AVIATION COMMUNICATION

6. State four purposes of standard words and phrases in aviation communication. **(4 marks)**

7. Explain the meaning and use of the following aviation communication phrases: (a) ground-to-ground; (b) ground-to-air; (c) read back; (d) transmission. **(8 marks)**

8. Describe four features of effective radio communication in an aviation environment. **(4 marks)**

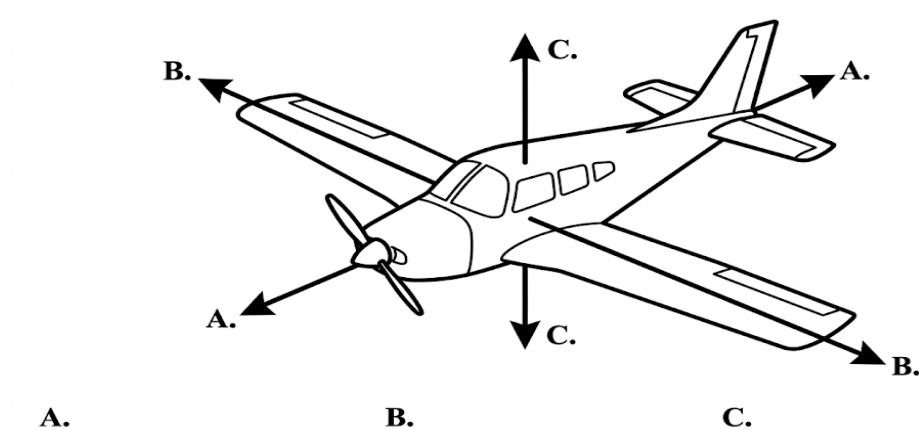
9. An aircraft is approaching an aerodrome where several ground personnel are working around the movement area. Explain how clear communication between flight crew and ground personnel contributes to safety. **(4 marks)**

SECTION C — AERODYNAMICS OF FLIGHT

10. (a) Name the two lower layers of the atmosphere discussed in the study of flight. (b) State one characteristic of each layer that is relevant to aviation. **(4 marks)**

Figure 1

AVIATION PRINCIPLES IDENTIFICATION EXERCISE



11. Using Figure 1, identify the three principal axes of an aircraft and state the rotational movement associated with each axis. **(6 marks)**

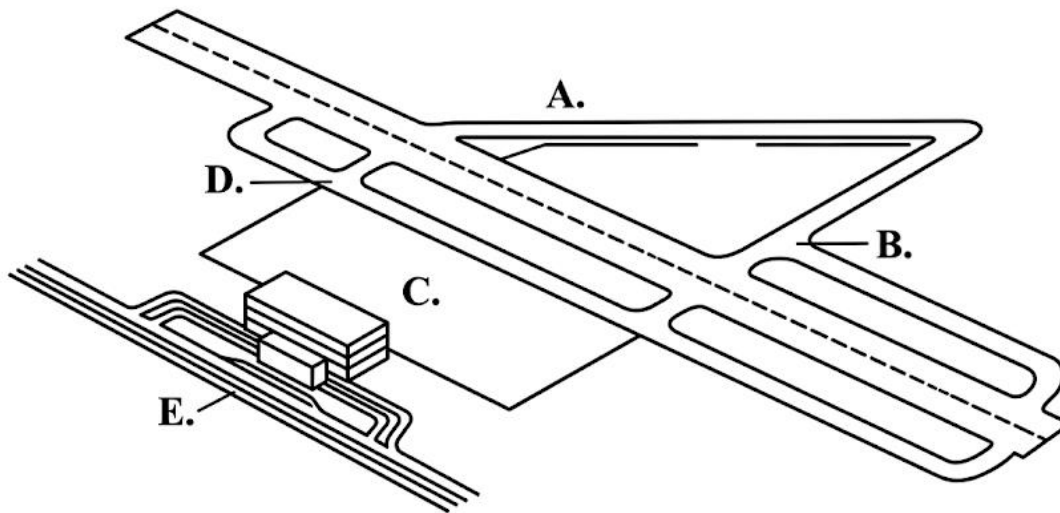
12. Name the four main forces that act on an aircraft in flight and explain the role of each force.
(6 marks)

13. Explain how Bernoulli's principle and Newton's laws help to explain the generation of forces involved in aircraft flight. **(4 marks)**

SECTION D — AIRPORT OPERATIONS

14. (a) State three categories of airports identified in the Curriculum Design. (b) Give one characteristic or use associated with each category. **(6 marks)**

Figure 2



A. _____ B. _____ C. _____ D. _____ E. _____

15. Using Figure 2, (a) identify the runway, taxiway, apron and terminal; (b) explain the function of any two of the identified areas. (6 marks)

16. Explain the roles of the following roads in airport operations: (a) runway; (b) taxiway; (c) service road; (d) access road. **(4 marks)**

17. State four consumer rights that should be observed in airport operations. **(4 marks)**

18. A small aviation business records the following amounts during one month: revenue KSh 480,000; expenses KSh 350,000. Calculate the profit and explain why keeping accurate financial records is important to an aviation business. **(4 marks)**

19. Explain two roles played by aviation businesses in airport operations and two ways in which consumer protection agencies contribute to protecting consumers. **(4 marks)**

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM

SMART-GRADE SERIES - (STEM PATHWAY)

BUILDING CONSTRUCTION

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

1. Write your name, assessment number, class/stream and date in the spaces provided.
2. Answer ALL questions.
3. Read each question carefully and use appropriate technical terminology.
4. Show all working and calculations where required.
5. Draw neat, well-proportioned diagrams where required and label them clearly.
6. Use appropriate units and dimensions.
7. Observe all relevant construction and workshop safety requirements when describing procedures.
8. The paper contains structured-response questions only.

EXAMINER'S USE ONLY

Section	Questions	Maximum Score	Score
A	1–5	25	
B	6–9	25	
C	10–12	30	
TOTAL		80	

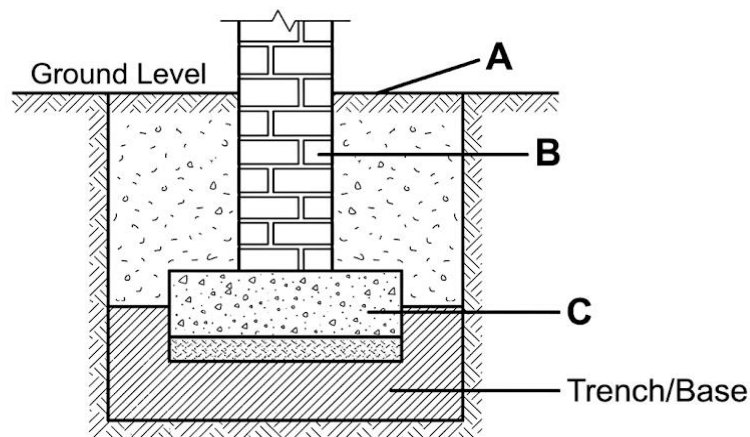
SECTION A — FOUNDATION AND RELATED DRAWING

1. State four functions of a building in day-to-day life. (4 marks)
2. Site preparation is carried out before construction begins. (5 marks)
 - (a) State two factors to consider when selecting a building site. (2 marks)
 - (b) State three methods of disposing of building waste safely. (3 marks)
3. Distinguish between isometric drawing and ordinary two-dimensional representation. (4 marks)
 - (a) State two characteristics of an isometric drawing. (2 marks)
 - (b) State two uses of isometric drawing in building construction. (2 marks)
4. A contractor is preparing to construct a small building. (5 marks)
 - (a) State three reasons for setting out a building accurately. (3 marks)
 - (b) Name two tools used when setting out a building. (2 marks)
5. State five safety precautions that should be observed during site preparation and clearing. (5 marks)

SECTION B — BUILDING CONSTRUCTION PROCESSES AND DRAWING

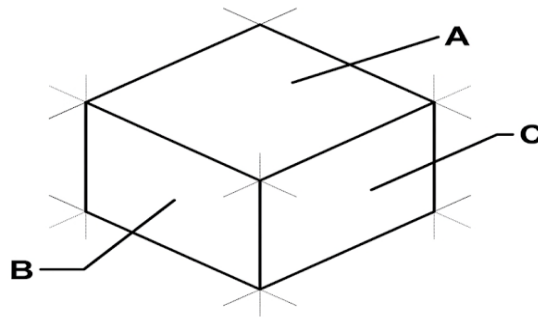
6. The diagram below represents a simplified cross-section of a strip foundation. (8 marks)

FIG. 1: STRIP FOUNDATION



- (a) Identify A, B and C. (3 marks)
 - (b) State the function of D. (2 marks)
 - (c) State three precautions to observe when preparing a foundation trench. (3 marks)
7. Concrete is required for a building project. (7 marks)
 - (a) Name the four constituent materials of ordinary concrete. (4 marks)
 - (b) State one purpose of compaction during concrete production. (1 marks)
 - (c) State two safety precautions when making or placing concrete. (2 marks)

8. The diagram below represents a simple isometric block. (5 marks)



(a) Identify the three visible faces represented by A, B and C. (3 marks)

(b) State one reason for using isometric projection in building drawing. (2 marks)

9. Foundation walling requires accurate setting out and construction. (5 marks)

(a) Name three tools or equipment used when constructing foundation walling. (3 marks)

(b) State two purposes of providing proper bonding in masonry walling. (2 marks)

SECTION C — APPLIED CONSTRUCTION AND BUILDING SERVICES

10. Timbering is used in foundation trenches. (8 marks)

(a) State two circumstances in which timbering of a foundation trench may be necessary. (2 marks)

(b) State three materials or components that may be used in timbering. (3 marks)

(c) Explain three safety precautions to observe when timbering a trench. (3 marks)

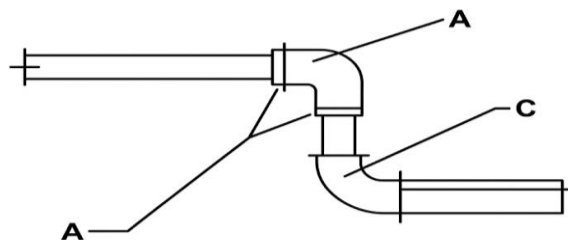
11. Ground floors may be constructed using different methods. (10 marks)

(a) Distinguish between a solid ground floor and a suspended ground floor. (4 marks)

(b) State three components or materials used in constructing a solid ground floor. (3 marks)

(c) State three purposes of damp-proofing in a ground floor. (3 marks)

12. The diagram below represents a simplified pipework arrangement. (8 marks)



(a) Identify A, B and C. (3 marks)

(b) State two factors to consider when selecting plumbing materials for a particular use. (2 marks)

(c) Describe the main steps followed when preparing a pipe joint. (3 marks)

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

ELECTRICITY

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

- Write your name and assessment details in the spaces provided.
- Read all questions carefully before answering.
- Answer ALL questions.
- Show all working where calculations are required.
- Use appropriate units in calculations and standard electrical symbols in diagrams.
- Label diagrams clearly where required.
- Write answers in the spaces provided where applicable.
- Use clear and legible handwriting.
- Check that all pages and questions are present.

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
A	1–10	20	
B	11–15	30	
C	16–18	30	
D	19–20	20	
TOTAL		100	

SECTION A — FOUNDATIONAL STRUCTURED QUESTIONS

Answer all questions in this section.

1. State two reasons why knowledge of electrical safety is important when carrying out electrical tasks. **(2 marks)**

2. Distinguish between a conductor and an insulator, giving one example of each. **(2 marks)**

3. Differentiate between a primary cell and a secondary cell. **(2 marks)**

4. State the principle on which a capacitor operates and name one application of a capacitor. **(2 marks)**

5. Name two types of pictorial drawing used in engineering representation. **(2 marks)**

6. State two magnetic properties of materials that are useful in electrical technology. **(2 marks)**

7. State two factors that affect the strength of an electromagnet. **(2 marks)**

8. What is meant by energy storage in an inductor? State one application of an inductor. **(2 marks)**

9. Name two stages or components involved between electrical generation and distribution to consumers. **(2 marks)**

10. State two items of equipment found at a consumer's power intake point. **(2 marks)**

SECTION B — APPLICATION, DATA, DIAGRAMS AND PROBLEM SOLVING

Answer all questions in this section.

11. A 12 V d.c. supply is connected to two resistors of $2\ \Omega$ and $4\ \Omega$ in series. **(8 marks)**

(a) Draw the circuit represented by the description, using standard electrical symbols. **(3 marks)**

DIAGRAM / WORKING AREA

(b) Calculate the total resistance of the circuit. **(2 marks)**

(c) Calculate the current flowing through the circuit. **(2 marks)**

(d) State the expected reading of the voltmeter. (1 marks)

12. A learner has two 1.5 V cells and a rechargeable secondary battery available for a low-voltage electrical application. (6 marks)

(a) Draw the arrangement of the two 1.5 V cells when connected in series and state the combined voltage. (3 marks)

DIAGRAM / WORKING AREA

(b) State three precautions for the safe maintenance or charging of rechargeable batteries.(3 marks)

13. Two capacitors of capacitance $2\ \mu\text{F}$ and $4\ \mu\text{F}$ are connected in parallel across a 12 V supply.

(6 marks)

(a) Calculate the total capacitance of the combination. (2 marks)

(b) State the voltage across each capacitor. (1 marks)

(c) Explain why capacitors can be useful in electrical control circuits such as timer circuits.

(3 marks)

14. A rectangular block is to be represented pictorially for an engineering drawing. **(4 marks)**

(a) Produce an isometric pictorial sketch of the block shown by the supplied diagram. **(3 marks)**

DIAGRAM / WORKING AREA

(b) State one advantage of pictorial drawings in engineering design. **(1 marks)**

15. A current-carrying conductor and a solenoid are used to demonstrate electromagnetism.

(6 marks)

(a) Draw the magnetic field pattern around a straight current-carrying conductor and indicate its direction. **(3 marks)**

DIAGRAM / WORKING AREA

(b) State three applications of electromagnets in electrical technology. **(3 marks)**

SECTION C — EXTENDED STRUCTURED APPLICATION

Answer all questions in this section.

16. An electrical device uses inductors in its circuit. The designer must select and connect inductors appropriately. **(10 marks)**

(a) Explain how an inductor stores energy. **(2 marks)**

(b) Two inductors of 3 H and 6 H are connected in series. Calculate their equivalent inductance. **(3 marks)**

(c) State two characteristics of an inductor that should be considered when selecting one for a d.c. circuit. **(2 marks)**

(d) Explain one practical application of an inductor in an electrical or electronic appliance. **(3 marks)**

17. A rural area is supplied through an electrical power grid. (10 marks)

(a) Draw a labelled block diagram showing the main stages from generation to distribution to consumers. **(5 marks)**

DIAGRAM / WORKING AREA

(b) Explain why high-voltage transmission is used in the power grid. **(2 marks)**

(c) State three reasons why a reliable national grid is important to socio-economic development. **(3 marks)**

18. An electrician is preparing to complete an electrical installation in a domestic building. (10 marks)

(a) Identify four items of equipment that may be found at the consumer's intake point. **(4 marks)**

(b) State the correct sequence in which the main control/protection equipment is connected at the consumer's intake point. **(3 marks)**

(c) State three checks or considerations an electrician should make before commissioning a final circuit. **(3 marks)**

SECTION D — ELECTRONICS AND INTEGRATED PROBLEM SOLVING

Answer all questions in this section.

19. Semiconductor materials are used to construct electronic devices. **(10 marks)**

(a) Explain the difference between intrinsic and extrinsic semiconductors. **(3 marks)**

(b) Explain how doping produces P-type and N-type semiconductor materials. **(3 marks)**

(c) Use a labelled sketch to show the formation of a PN junction. **(2 marks)**

DIAGRAM / WORKING AREA

(d) State two reasons semiconductor materials are important in electronic engineering. **(2 marks)**

20. A technician is testing a diode and a transistor in an electronic switching circuit. **(10 marks)**

(a) Describe the operation of a semiconductor diode under forward bias and reverse bias. **(4 marks)**

(b) State two applications of diodes in electronic systems. **(2 marks)**

(c) A transistor is used as a switch. Explain how changing its input condition can control current in the output circuit. **(3 marks)**

(d) State one safety or troubleshooting precaution when testing electronic components in a circuit. **(1 marks)**

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

MARINE TECHNOLOGY

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

- Write your name and assessment details in the spaces provided.
- Answer ALL questions.
- Read each question carefully before answering.
- Show all working and reasoning where required.
- Label all diagrams clearly and draw neatly where a drawing is required.
- Use appropriate terminology relating to marine and fisheries technology.
- Write your answers in the spaces provided or immediately following the question.
- Check that all pages and questions are present before leaving the examination room.

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
Section A	1–3	24	
Section B	4–6	26	
Section C	7–9	30	
TOTAL		80	

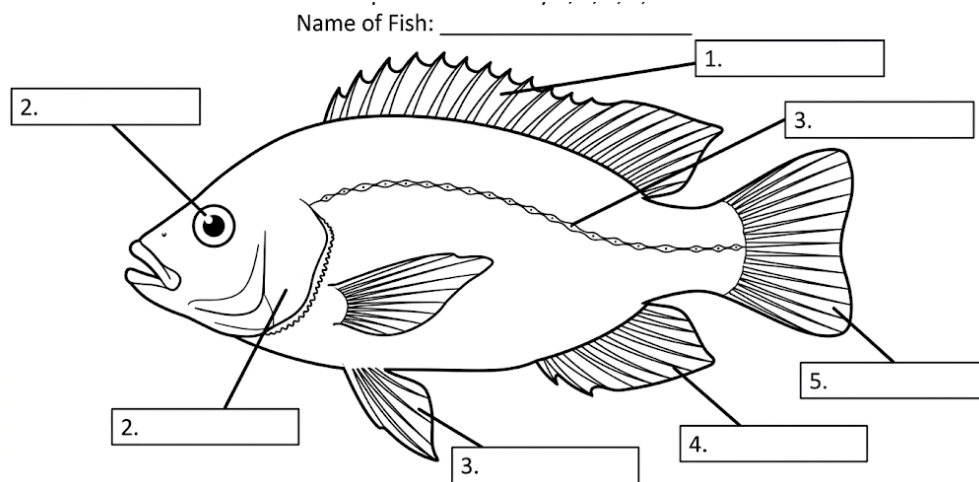
SECTION A: FISH BIOLOGY AND ECOLOGY

1. (a) State four opportunities available in marine and freshwater fisheries. (4 marks)

(b) Describe two basic characteristics of marine or freshwater environments that support fish life.

(4 marks)

2. (a) Study the fish diagram below and answer the question that follows. (5 marks)



Label on the diagram five indicated external features. (5 marks)

(b) Give three differences between bony fishes and cartilaginous fishes. (3 marks)

3. Explain four ways in which an aquatic ecosystem can support fish and other aquatic organisms. **(8 marks)**

SECTION B: AQUACULTURE

4. (a) Describe three different types of aquaculture systems. **(3 marks)**

(b) Explain three reasons why aquaculture is economically important to Kenya. **(3 marks)**

(c) State two challenges facing aquaculture development in Kenya. **(2 marks)**

5. A school intends to establish a small fish production unit. Answer the following. **(8 marks)**

(a) Identify four factors that should be considered when selecting a suitable site for a fish pond.

(4 marks)

(b) State four features that should be considered when constructing a simple fish pond. **(4 marks)**

6. (a) Draw and label a simple fish production system suitable for a school aquaculture project.

(4 marks)

(b) State four management practices that should be carried out after stocking a fish pond. **(4 marks)**

SECTION C: CAPTURE FISHERIES, SAFETY AND APPLICATION

7. (a) **Identify the** three main types of capture fisheries given in the Curriculum Design. **(3 marks)**

(b) Explain three characteristics of artisanal/small-scale fisheries. **(3 marks)**

(c) Explain two ways in which capture fisheries contribute to the Kenyan economy. **(2 marks)**

8. A fishing crew is preparing to operate a vessel in an aquatic environment. **(12 marks)**

(a) Describe four types of accidents that may occur during fishing activities and state one possible cause of each. **(4 marks)**

(b) Identify four pieces of safety equipment required in a fishing vessel and state the purpose of each. **(4 marks)**

(c) State two basic survival techniques that can be practised in an aquatic environment. **(2 marks)**

(d) State two first-aid actions that may be taken for injuries related to fishing activities. **(2 marks)**

9. A community is considering whether to expand a capture-fishing activity or establish a fish pond.

Using knowledge from the Grade 10 course: **(10 marks)**

(a) Compare the two options under four relevant considerations, such as production system, management requirements, safety, or resource use. **(4 marks)**

(b) Recommend four responsible practices that would promote safe, sustainable and productive use of fisheries resources. **(4 marks)**

(c) State two ways learners can promote awareness of safety and sustainable fisheries practices in their community. **(2 marks)**

END OF QUESTION PAPER

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

MEDIA TECHNOLOGY

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

1. Write your name and assessment details in the spaces provided.
2. Read all questions carefully before answering.
3. Answer all questions.
4. Show all working where calculations or planning are required.
5. Label diagrams clearly where required.
6. Use appropriate technical terminology.
7. All answers should be written in the spaces provided where applicable.
8. Use clear and legible handwriting.
9. Check the question paper to ensure that all pages and questions are present.

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
A	1–8	20	
B	9–12	40	
C	13–15	40	
TOTAL		100	

SECTION A — FOUNDATIONAL STRUCTURED QUESTIONS (20 MARKS)

1. Differentiate between print media and electronic media, giving one example of each. **(3 marks)**

2. State three duties of personnel involved in the pre-production phase of media content creation. **(3 marks)**

3. Give two reasons why research is important before producing media content. **(2 marks)**

4. State three key activities carried out during the production phase of a media project. **(3 marks)**

5. State two functions of post-production in media content creation. **(2 marks)**

6. Name two photography genres and state one suitable subject or situation for each. **(4 marks)**

7. State two functions of a camera component and two functions of an audio-production component.

(4 marks)

8. State three factors a learner should consider when choosing a media company structure or ownership arrangement in Kenya. **(3 marks)**

SECTION B — APPLICATION, DATA, DIAGRAMS AND PROBLEM SOLVING (40 MARKS)

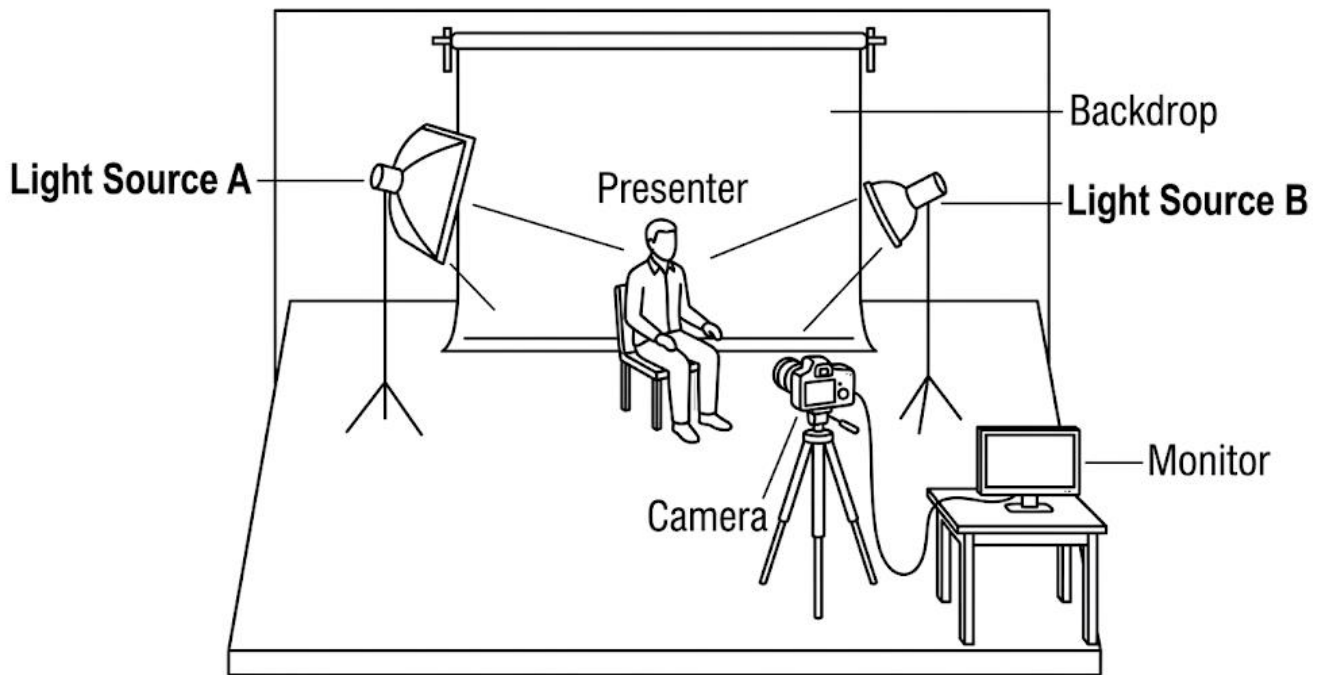
9. A school media club is preparing a short educational video on cyber safety. The producer has asked the team to prepare before recording begins. **(8 marks)**

(a) Outline four activities that should be completed during pre-production. **(4 marks)**

(b) Explain two ways the target audience should influence the media production plan. **(4 marks)**

Figure 1: Basic studio set-up

10. Study the figure below and answer the following.



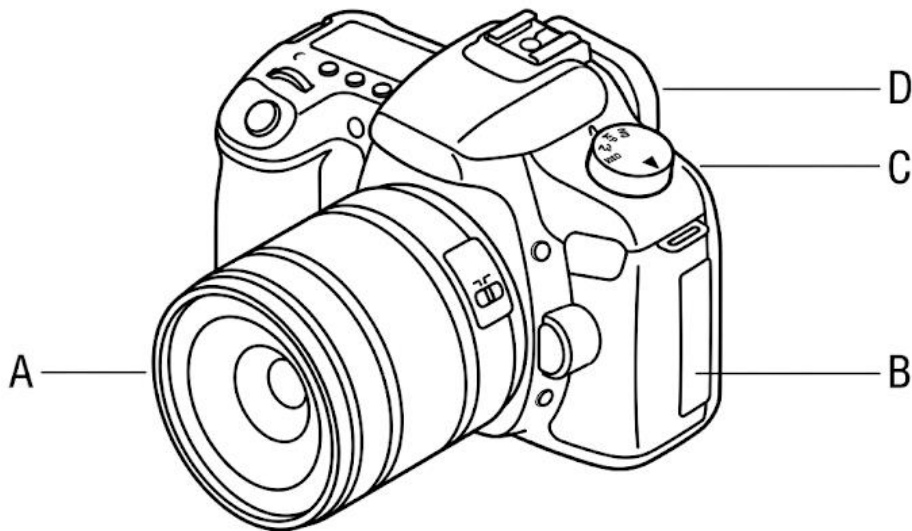
(a) Identify the purpose of the two light sources labelled A and B in the set-up. (2 marks)

(b) State four precautions that should be observed when setting up and operating equipment in a media studio. (4 marks)

(c) State two pieces of information that should be checked before recording begins. (4 marks)

Figure 2: Digital camera

11. Study the figure shown below and answer the following.



(a) Name the four indicated camera components. (4 marks)

(b) Explain two ways camera accessories can improve the quality or stability of photographic work. (4 marks)

(c) State two photography genres that can be used to tell a story visually. (2 marks)

[illegible]

13. A school plans to produce a five-minute documentary about responsible use of digital media. Develop a production plan covering the following. **(14 marks)**

[illegible]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(a) State the purpose and target audience of the documentary. (2 marks)

(b) Outline four pre-production activities, showing the order in which they should be undertaken.
(4 marks)

(c) Describe four production activities that will help the team obtain usable video and sound.
(4 marks)

(d) Explain two post-production activities that should be carried out before distribution. (4 marks)

14. A learner intends to establish a small media enterprise that offers photography, video and audio services. (12 marks)

(a) Describe three forms of media ownership that may be found in Kenya. (6 marks)

(b) Explain three factors the learner should consider when selecting an appropriate ownership structure for the enterprise. (6 marks)

15. A media company is preparing to release a video created using photographs, recorded interviews and background audio. Analyse the workflow from the original content to the final distributed product. In your response, include: research and planning, production, post-production, safe and ethical handling of media content, and at least two ways technology can affect the process. **(14 marks)**

END OF QUESTION PAPER

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

METAL WORK

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

1. Write your name and assessment details in the spaces provided.
2. Read all questions carefully before answering.
3. Answer ALL questions.
4. Show all working and construction steps where required.
5. Use appropriate drawing instruments for technical drawing questions.
6. Label sketches and diagrams clearly.
7. Use correct units and conventions where applicable.
8. All answers must be written in the spaces provided where applicable.
9. Use clear and legible handwriting.
10. Check that all pages and questions are present before beginning.

EXAMINER'S USE ONLY

Section	Question Numbers	Maximum Score	Candidate's Score
A	1–10	30	
B	11–16	30	
C	17–19	20	
D	20–22	20	
TOTAL		100	

SECTION A — FUNDAMENTALS, TOOLS AND MATERIALS (30 marks)

Answer all questions.

1. Define the term metalwork as a learning area and state two reasons for studying metalwork. (3 marks)

2. State three workshop safety rules that should be observed when working with metal. (3 marks)

3. (a) State two examples of hand tools used in a metal workshop. (2 marks)

(b) Give one use for each tool named in (a). (2 marks)

4. Distinguish between a measuring tool and a marking-out tool, giving one example of each. (4 marks)

5. State three factors to consider when selecting a hand or bench tool for a given task. (3 marks)

6. (a) Distinguish between ferrous and non-ferrous metals. (2 marks)

(b) Give two examples of ferrous metals and two examples of non-ferrous metals. (4 marks)

7. State three properties of metals that influence their selection for workshop applications. (3 marks)

8. State two forms in which metal may be supplied for use in a metal workshop. (2 marks)

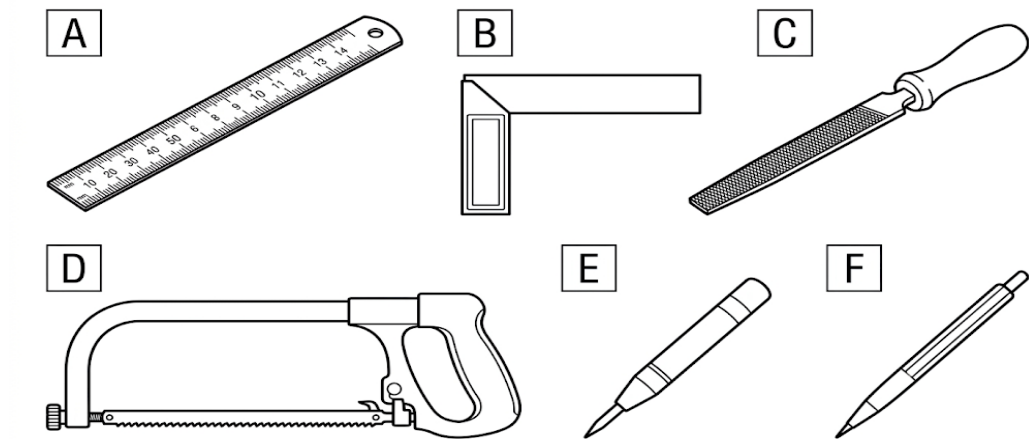
SECTION B — MEASURING, DRAWING AND WORKSHOP APPLICATION (30 marks)

Answer all questions.

11. A learner is required to prepare a small sheet-metal component from a rectangular blank.

Explain the sequence of operations that should be followed from measurement and marking-out to completion. (6 marks)

12. The following visual is to be used to assess identification of common metalwork tools.



(a) Identify tools A, B and C. (3 marks)

(b) State one use of each of the three tools identified in (a). (3 marks)

13. (a) State three purposes of using scales, symbols, abbreviations and conventions in technical drawing. (3 marks)

(b) Explain the difference between a plane scale and a diagonal scale. (2 marks)

[illegible]

16. State three ways in which good maintenance of measuring and marking-out tools improves workshop work. (3 marks)

SECTION C — METAL JOINING AND SHEET-METAL PROCESSES (20 marks)

Answer all questions.

17. (a) Name three methods of joining sheet metal covered in the curriculum. (3 marks)

(b) State one suitable application for each method named in (a). (3 marks)

18. A learner has to join two pieces of sheet metal permanently. Explain four factors that should guide the selection of the joining method. (4 marks)

19. (a) Explain the following sheet-metal processes: edge treatment, hollowing, sinking and raising. (8 marks)

(b) State two safety precautions to observe when carrying out sheet-metal processes. (2 marks)

SECTION D — INTEGRATED APPLICATION AND PROJECT WORK (20 marks)

Answer all questions.

20. A community has identified a need for a simple metal item that can be fabricated using locally available materials.

(a) State a suitable metal item that could solve a practical community problem. (2 marks)

(b) Describe the problem the item would solve and the users who would benefit from it. (4 marks)

(c) Outline four stages you would follow from identifying the problem to presenting the fabricated item. (4 marks)

21. Explain four ways in which safety, responsibility and care for tools and materials should be demonstrated during a metalwork project. (4 marks)

22. Prepare a simple labelled project plan for fabricating the item proposed in Question 20. Your plan should show: materials, tools/equipment, major operations, safety precautions and the expected final product. (6 marks)

END OF QUESTION PAPER

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM

SMART-GRADE SERIES - (STEM PATHWAY)

POWER MECHANICS

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS

1. Answer ALL questions.
2. Read each question carefully and show all working where applicable.
3. Use appropriate technical drawing instruments where a construction is required.
4. All sketches and diagrams must be clear and well labelled.
5. Use the spaces provided.

SECTION A — FUNDAMENTALS OF POWER MECHANICS (30 MARKS)

1. Overview and evolution of power mechanics (8 marks)

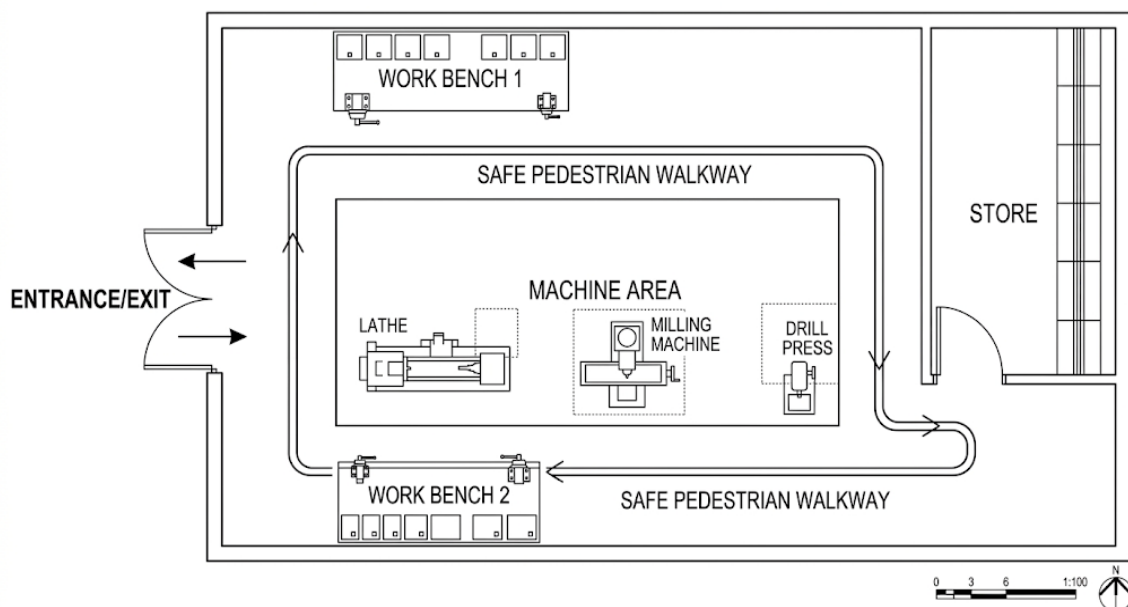
(a) Define Power Mechanics as a learning area. (2 marks)

(b) State two opportunities for further study or careers related to power mechanics. (2 marks)

(c) State two ways in which power mechanics contributes to society. (2 marks)

(d) State two important developments in the historical evolution of motor vehicles. (2 marks)

2. Power mechanics workshop layout.



(a) Identify four main areas that should be considered in a power mechanics workshop layout.

(4 marks)

(b) State two reasons why a good workshop layout is important. **(2 marks)**

(c) State two safety considerations when arranging workshop floor markings. **(2 marks)**

3. General workshop rules and regulations (7 marks)

(a) State three general safety rules applicable in a power mechanics workshop. **(3 marks)**

(b) State two behaviours that should be avoided in a power mechanics work environment.

(2 marks)

(c) Name two items of personal protective equipment (PPE) and state the purpose of each.

(2 marks)

4. Safety signs and PPE (7 marks)

(a) Differentiate between prohibition, mandatory, warning and fire-equipment signs. (4 marks)

(b) State three situations in which PPE is necessary in a power mechanics workshop. (3 marks)

SECTION B — RELATED TECHNICAL DRAWING (25 MARKS)

5. Diagonal scale.

(a) State the purpose of a diagonal scale in technical drawing. (2 marks)

(b) Construct a diagonal scale capable of measuring metres, decimetres and centimetres for a representative scale of 1:10. Clearly show the construction and subdivisions. **(5 marks)**

[illegible]

(c) State two applications of diagonal scales. (2 marks)

6. Loci in power mechanics.

(a) Define a locus in technical drawing. (2 marks)

(b) Name two types of loci that may be used in technical drawing. (2 marks)

(c) Describe the procedure you would use to construct the locus of point P in the mechanism shown. (4 marks)

7. Tangency and blending of lines and curves (8 marks)

(a) Define tangency. (2 marks)

(b) State two methods or constructions used when drawing tangents. (2 marks)

(c) Describe how to construct a tangent from a point outside a circle.

(4 marks)

SECTION C — MOTOR VEHICLE SYSTEMS (25 MARKS)

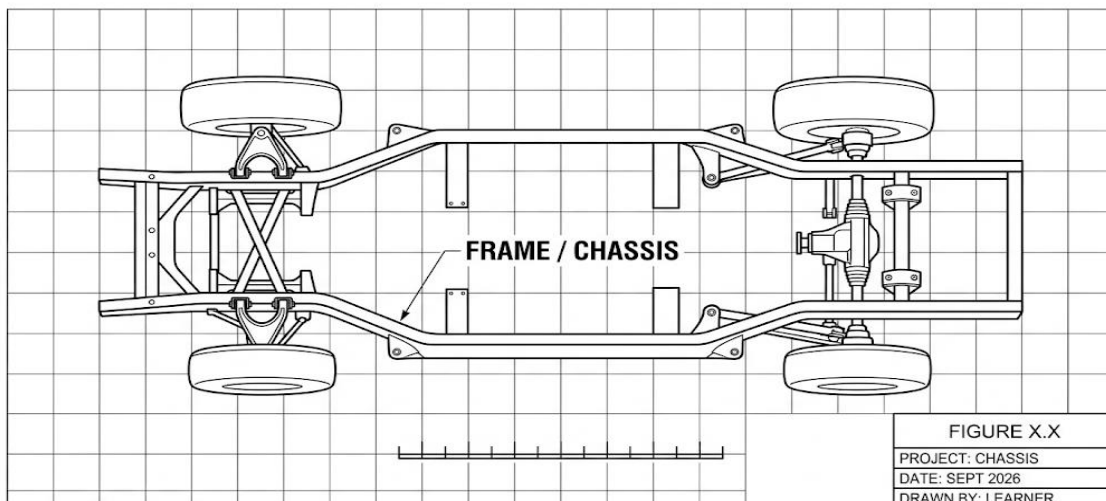
8. Road wheels and tyres (8 marks)

(a) State three functions of tyres on a motor vehicle. (3 marks)

(b) Explain how incorrect tyre pressure can affect road safety. (2 marks)

(c) State three basic tyre-maintenance practices. (3 marks)

9. Motor vehicle body and chassis.



(a) State three functions of a motor vehicle body. (3 marks)

(b) Name three types of chassis/frame sections used in motor vehicles. (3 marks)

(c) State three safety features incorporated into a motor vehicle chassis or body. (3 marks)

10. Motor vehicle body joining processes.

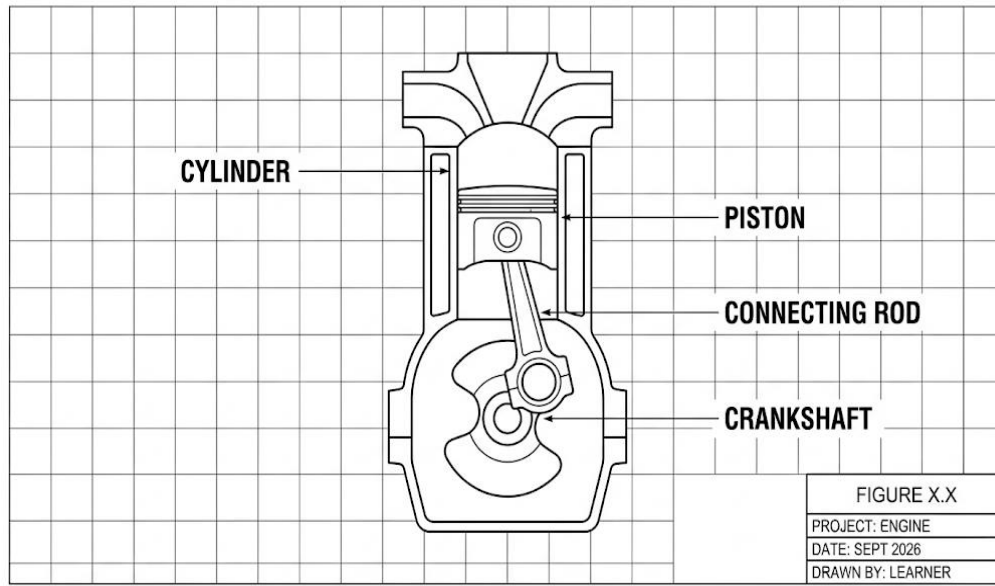
(a) Name four joining processes used in motor vehicle body work. (4 marks)

(b) State two examples of threaded fasteners used in motor vehicle body joining. (2 marks)

(c) State two advantages of using adhesives in motor vehicle body joining. (2 marks)

SECTION D — ENGINES (20 MARKS)

11. Introduction to engines and engine terminology (7 marks)



(a) Define an engine as used in power mechanics. (2 marks)

(b) State the meaning of bore, stroke and engine capacity. (3 marks)

(c) A cylinder has a bore diameter of 80 mm and a stroke of 90 mm. Calculate its swept volume using $V = \pi d^2 L / 4$. Give the answer in cm^3 . (2 marks)

12. Classification and types of engines (6 marks)

(a) State three methods of classifying engines. (3 marks)

(b) Distinguish between external combustion and internal combustion engines. (2 marks)

(c) Give one example of an engine classified according to fuel type. (1 marks)

13. Engine components and functions (7 marks)

(a) Name four major components of an internal-combustion engine. (4 marks)

(b) State the function of the crankshaft, camshaft and piston. (3 marks)

END OF QUESTION PAPER

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAM **SMART-GRADE SERIES - (STEM PATHWAY)**

WOOD TECHNOLOGY

TIME: 2½ HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

CLASS..... SIGN.....

INSTRUCTIONS TO CANDIDATES

1. Answer *ALL* questions.
2. Read each question carefully and show clear working where applicable.
3. Study all figures carefully before answering related questions.
4. Use appropriate woodwork terminology.
5. Observe safety requirements when describing tools, equipment and processes.
6. Write neatly in the spaces provided.

EXAMINER'S USE ONLY

Questions	Maximum Score	Candidate Score	Remarks
Q1–Q4	22		
Q5–Q8	25		
Q9–Q11	19		
Q12–Q13	14		
TOTAL	80		

SECTION A — FOUNDATIONS OF WOODWORK

1. Woodwork and the Workshop. State five reasons why studying Woodwork is important to an individual and the economy. (5 marks)

2. Study Figure 1, a simplified wood workshop layout. (5 marks)

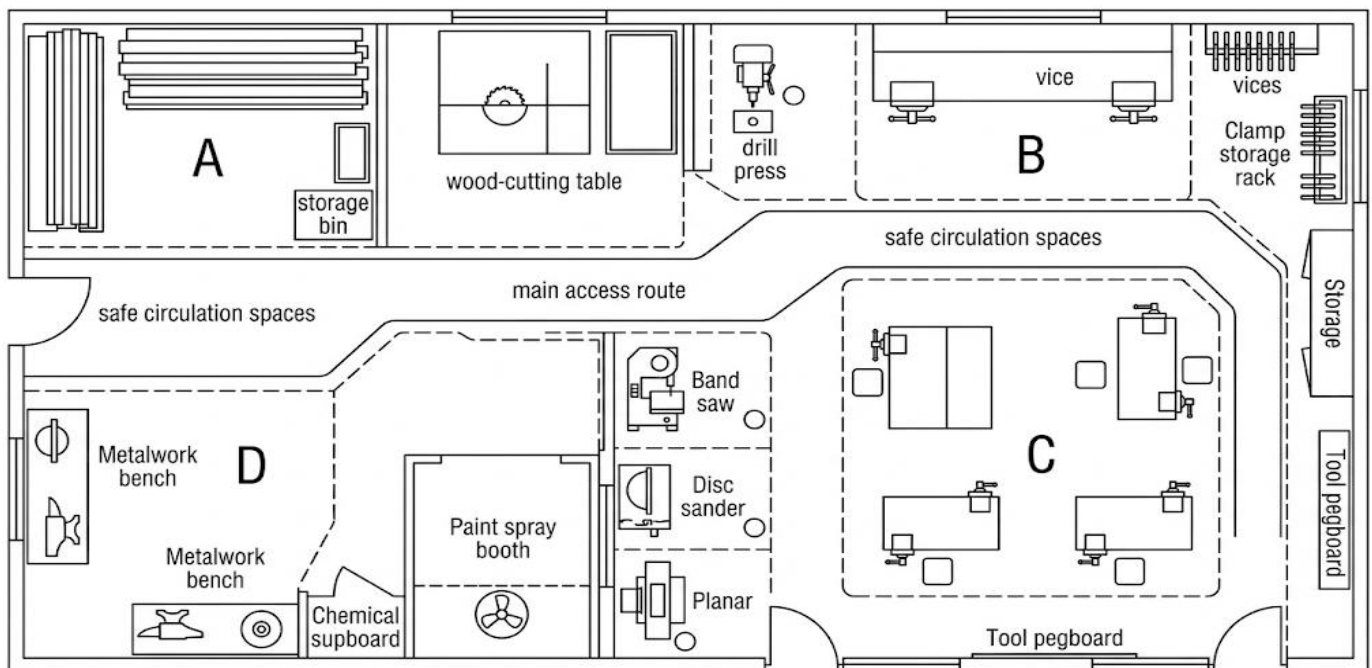


Figure 1

(a) State two features of a well-organised wood workshop that can be identified or inferred from the figure. (2 marks)

(b) State three safety measures that should be observed in a wood workshop. (3 marks)

3. Hand Tools and Equipment. Study Figure 2. (6 marks)

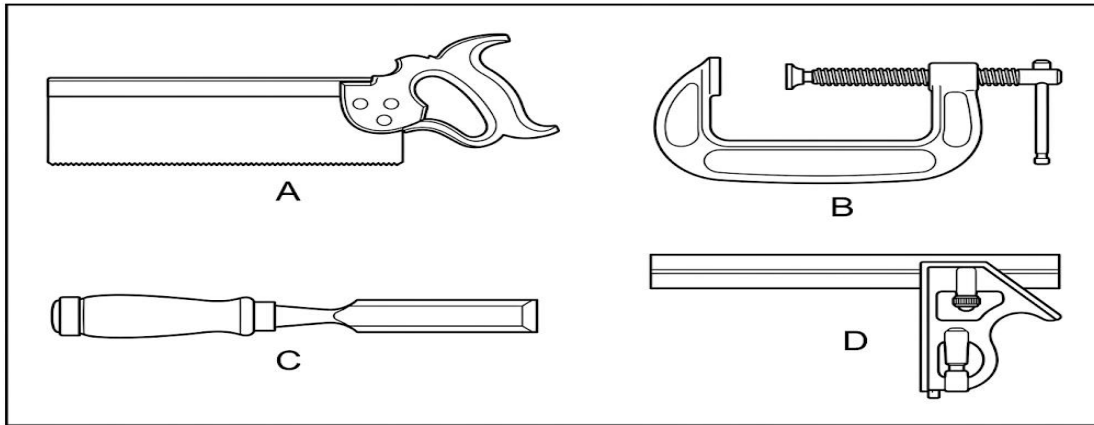


Figure 2

(a) Identify tools A, B, C and D. (4 marks)

(b) State two rules for safe care and maintenance of hand tools and equipment. (2 marks)

4. Materials — Growth of Timber Trees. Study Figure 3. (6 marks)

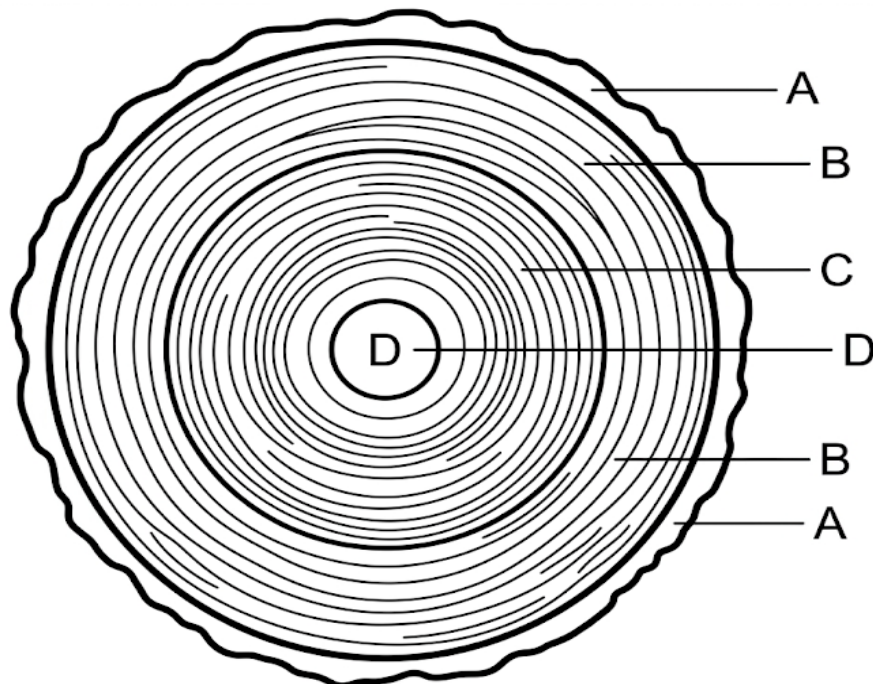


Figure 3

(a) Identify any three parts represented by A–D. (3 marks)

(b) State three reasons why knowledge of tree growth is important in Woodwork. (3 marks)

SECTION B — MATERIALS AND WOOD PROCESSES

5. Timber Conversion and Seasoning. (a) Explain timber conversion. (b) State three methods of timber conversion. (c) Give two reasons why timber seasoning is necessary. (6 marks)

6. Adhesives. (a) State three types or classifications of adhesives used in bonding materials. (b) State two precautions when using or disposing of wood adhesives. (5 marks)

7. Preparation of Wood. A learner is preparing a timber piece for a furniture item. State the appropriate tools/equipment and explain five operations that may be carried out during preparation of wood. (7 marks)

8. Woodworking Joints. Study Figure 4. (7 marks)

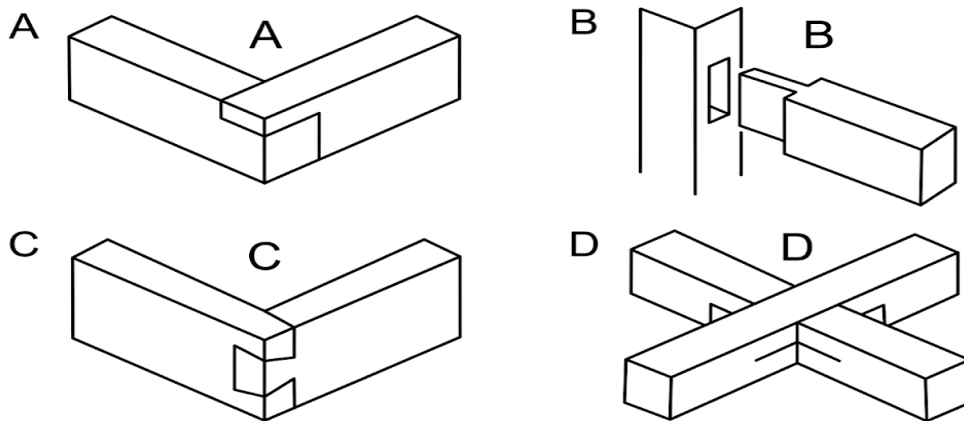


Figure 4

(a) Identify any three joint types represented in the figure. (3 marks)

(b) State two reasons why joints are important in making wood products. (2 marks)

(c) State two considerations when selecting a joint for a furniture item. (2 marks)

SECTION C — SURFACE PREPARATION AND PROJECT ACTIVITY

9. Surface Preparation. Explain the purpose of preparing a wooden surface before receiving a finish.
State four materials/tools that may be used during surface preparation. (5 marks)

10. Project Activity — Furniture Item. A learner is required to make a small wooden furniture item.
Outline eight major stages from selecting materials and tools to final sanding/finishing, including
safe working practices. (8 marks)

11. Production Decision-Making. A workshop has limited timber, tools and time. Explain six
decisions the learner should make to complete the project efficiently while minimising waste and
maintaining safety. (6 marks)

SECTION D — RELATED DRAWINGS AND APPLICATION

12. Study Figure 5, an isometric representation of a simple wooden block. (7 marks)

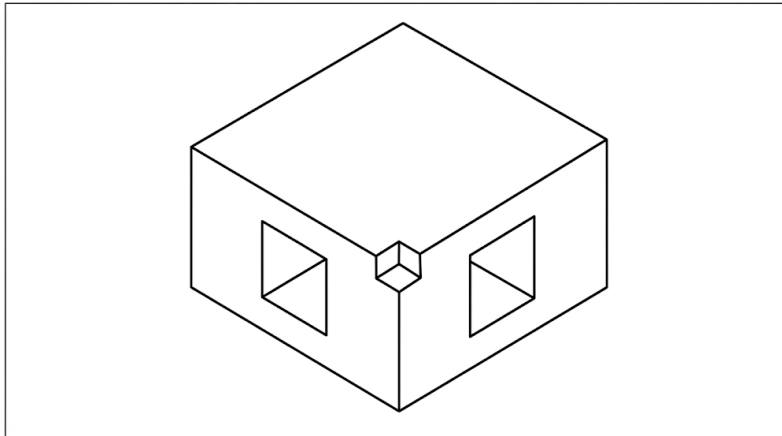


Figure 5

(a) State the type of pictorial drawing represented by Figure 5. (1 marks)

(b) Sketch the front orthographic view of the object. (3 marks)

(c) State three uses of drawings in the Woodwork design and production process. (3 marks)

13. Integrated Woodwork Application. A learner plans to produce a useful furniture item for the school. Describe how the learner should use drawing/sketching, material selection, joint selection, wood preparation, surface preparation and safe tool use to produce the item successfully. (7 marks)
