

GRADE 10 ENDTERM 3 EXAMS

ALL SUBJECTS

(STEM PATHWAY SET)

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ALL SUBJECTS TESTED.

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SERIES 1

For Marking Schemes

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

MWALIMU CONSULTANCY

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

AGRICULTURE

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

1. Write your name in the spaces provided above.
2. Write the name of your school and your stream in the spaces provided.
3. Write your admission number and the date of the assessment in the spaces provided.
4. This paper consists of two sections: A and B.
5. Answer all questions in section A and section B.
6. Answer the questions in English.
7. All answers **MUST** be written in the spaces provided in the paper.
8. Do **NOT** remove any page from this question paper.

FOR OFFICIAL USE ONLY (EXAMINER'S USE)

SECTION	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)**Answer ALL questions in this section.**

1. A farmer in Kisii County wants to establish a vegetable farm. Before acquiring land, she considers factors such as soil characteristics, slope, rainfall and accessibility.

a) State **two factors** that determine the suitability of land for agricultural production. **(2 marks)**

i. _____

ii. _____

b) Give **one reason** why land productivity should be considered before establishing a farm.

(1 mark)

2. During a practical lesson, learners collected three soil samples.

i. Sample X felt gritty when rubbed between the fingers, while

ii. Sample Y felt smooth and sticky when wet.

a) Identify the soil represented by Sample X. _____ **(1 mark)**

b) Identify the soil represented by Sample Y. _____ **(1 mark)**

c) State **one advantage** of loamy soil for crop production. **(1 mark)**

3. A farmer intends to prepare a field for planting maize.

a) Name **two primary land preparation operations** that may be carried out before planting.

(2 marks)

i. _____

ii. _____

b) Explain **one importance** of proper land preparation.

(1 mark)

4. A maize farmer notices that some young plants have been attacked by weeds shortly after germination.

a) State **two harmful effects of weeds** on crops. (2 marks)

i. _____

ii. _____

b) Name **one method** of controlling weeds in a maize field. (1 mark)

5. A farmer wants to maintain good crop growth throughout the growing period.

State **three field management practices** that the farmer can carry out after crop establishment.

(3 marks)

i. _____

ii. _____

iii. _____

6. A farmer harvested tomatoes when some fruits were still green while others were fully ripe.

a) State **one indicator** that can be used to determine the maturity of a crop. (1 mark)

b) Give **one reason** why crops should be harvested at the correct stage of maturity. (1 mark)

7. A dairy farmer is selecting cattle for milk production.

State **two characteristics** that the farmer should consider when selecting a good dairy breed.

(2 marks)

i. _____

ii. _____

8. During an Agriculture practical lesson, learners were shown a cow that was restless and attempting to kick.

a) State **one safety precaution** that should be taken when handling the animal. (1 mark)

b) Give **one reason** why animals should be handled calmly. (1 mark)

9. A farmer observes that one of her goats has lost appetite, has a dull coat and appears weak.

a) State **one possible indication** that the animal is unhealthy. (1 mark)

b) Give **one general measure** that can be taken to prevent diseases in livestock. (1 mark)

10. A group of learners establishes a small beekeeping project at school.

State **two products** that can be obtained from honey bees. (2 marks)

i. _____

ii. _____

11. A farmer has the following tools:



a) State the use of a **secateurs** in crop production. (1 mark)

b) State **one maintenance practice** that should be carried out on farm tools after use. (1 mark)

12. A youth group processes fresh mangoes into mango juice and packaged dried mango slices.

a) Identify the agricultural activity illustrated above. (1 mark)

b) State **one benefit** of adding value to agricultural produce. (1 mark)

13. A farmer produces 500 kg of tomatoes. After sorting, grading and packaging, she sells the produce directly to consumers at a higher price.

a) Name the process of grouping agricultural produce according to quality and size. (1 mark)

b) State **one advantage** of proper packaging of agricultural produce. (1 mark)

14. A school Agriculture club plans to establish a small vegetable enterprise.

State **two factors** that should be considered before establishing the enterprise. (2 marks)

i. _____

ii. _____

15. A farmer has crop residues, animal manure and dry leaves available on the farm.

a) Name the process of converting these materials into a useful organic manure. (1 mark)

b) State **one benefit** of using compost manure in crop production. (1 mark)

SECTION B: 50 MARKS**Answer ALL questions in this section.**

16. A farmer in Narok County plans to establish a 5-hectare maize farm. The farm has gently sloping land, receives adequate rainfall and has a mixture of sandy and clay soils. The farmer intends to conduct a soil assessment before beginning land preparation.

a) Explain **four factors** that the farmer should consider when evaluating the suitability of the land for maize production. **(4 marks)**

b) Describe **three physical properties of soil** that influence crop production. **(3 marks)**

c) Explain **three ways** in which a farmer can conserve soil on sloping agricultural land. **(3 marks)**

17. A farmer planted beans on a one-acre field. Two weeks after germination, the farmer noticed that weeds were competing with the beans. Some plants were also showing signs of poor growth. The farmer decides to improve field management practices.

a) Explain **four harmful effects of weeds** on crop production. **(4 marks)**

b) Describe **three appropriate field management practices** that the farmer can undertake to improve the growth of the beans. **(3 marks)**

c) State **three factors** that should be considered when determining the correct time to harvest a crop. **(3 marks)**

18. A farmer wants to start a small dairy enterprise. He plans to purchase two dairy cattle and intends to establish good animal health and handling practices.

a) Explain **three characteristics** of a good dairy animal. **(3 marks)**

b) Describe **three safe practices** that should be followed when handling livestock. **(3 marks)**

c) Explain **two measures** that can be used to prevent the spread of diseases in livestock. **(2 marks)**

d) State **two signs** that may indicate that an animal is unhealthy. **(2 marks)**

- i.

- ii.

19. A Grade 10 Agriculture class establishes a beekeeping project as part of an enterprise activity.

The learners plan to harvest honey and sell it after proper processing and packaging.

a) Explain **three factors** that should be considered when selecting a suitable site for a beehive.

(3 marks)

b) State **two precautions** that should be taken when harvesting honey. **(2 marks)**

i. _____

ii. _____

c) Explain **three ways** through which an animal-rearing or beekeeping project can benefit learners.

(3 marks)

d) State **two records** that should be maintained in an agricultural enterprise. **(2 marks)**

i. _____

ii. _____

20. A youth group in Kisumu County produces tomatoes. Instead of selling all the tomatoes fresh, the group decides to process some into tomato sauce. The members package and label the product before selling it to consumers.

a) Explain **three reasons** why agricultural produce is processed and value-added. **(3 marks)**

b) Describe **three factors** that the group should consider when choosing a market for its tomato products. (3 marks)

c) The group harvested **800 kg** of tomatoes. It sold **600 kg** at **KSh 50 per kilogram**. Calculate the total amount of money received from the sale. (2 marks)

d) State **two qualities** of a successful agricultural entrepreneur. (2 marks)

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

BIOLOGY

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

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POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)**Answer ALL questions in this section.**

1. A learner was tasked with defining the term Biology.

a) State the correct meaning of Biology.

(1 mark)

b) Give **two ways** in which Biology can be applied in solving community problems. (2 marks)

2. During a field study, learners collected leaves, insects and small organisms for identification.

a) Name **two apparatus** that can be used to collect biological specimens.

(2 marks)

b) State **one reason** why biological specimens should be properly preserved.

(1 mark)

3. A student observed a cell using a light microscope.

a) State the function of the **nucleus**.

(1 mark)

b) Give **two differences** between a plant cell and an animal cell. (2 marks)

Plant cell	Animal cell

4. The diagram below represents a specialized cell.



a) Identify the likely specialised cell represented. _____ (1 mark)

b) State **one adaptation** that enables the cell to perform its function efficiently. (1 mark)

5. Food samples were tested in a school laboratory.

a) Name the reagent used to test for **starch**. _____ (1 mark)

b) State the colour change expected when starch is present. (1 mark)

c) Name the reagent used to test for **reducing sugars**. _____ (1 mark)

6. A farmer noticed that a plant kept in darkness for several days had pale leaves.

a) Name the process by which green plants manufacture food. _____ (1 mark)

b) State **two conditions** necessary for this process. (2 marks)

7. A learner placed a leafy plant in sunlight and covered one leaf with opaque paper.

a) Why was the leaf partly covered? (1 mark)

b) Which substance is being investigated in this experiment? (1 mark)

8. The table below shows the results obtained when a student investigated water movement in plant tissues.

Tissue	Movement of water
X	Upward
Y	Downward

a) Identify tissue X. _____ (1 mark)

b) Identify tissue Y. _____ (1 mark)

9. During a Biology lesson, learners observed that a person breathes faster immediately after vigorous exercise.

a) State **one reason** for the increased breathing rate. (1 mark)

b) Name the gas required by body cells during aerobic respiration. _____ (1 mark)

10. A student investigated the effect of temperature on the rate of respiration in yeast.

a) State the role of yeast in the investigation. (1 mark)

b) Give **one observable indication** that respiration is taking place. (1 mark)

11. A learner ate a meal containing carbohydrates, proteins and fats.

a) State the main function of carbohydrates in the body. (1 mark)

b) State **one function** of proteins in the body. (1 mark)

c) State **one function** of fats and oils. (1 mark)

12. State **three characteristics** that distinguish living organisms from non-living things. (3 marks)

i. _____

ii. _____

iii. _____

SECTION B: 50 MARKS

Answer all questions in this section.

13. A Biology teacher gave a group of learners a specimen of an onion epidermis and instructed them to prepare a temporary slide for microscopic observation.

a) State **two materials** required when preparing the temporary slide. (2 marks)

i. _____

ii. _____

b) Describe how the onion epidermis can be prepared for observation under a light microscope.

(4 marks)

i. _____

ii. _____

iii. _____

iv. _____

c) State **two functions** of the microscope in biological investigations. (2 marks)

i. _____

ii. _____

d) Give **two safety precautions** that should be observed when handling a microscope and biological specimens. (2 marks)

i. _____

ii. _____

14. The cells of multicellular organisms are specialised to perform different functions.

a) Explain the meaning of **cell specialisation**. (2 marks)

b) Complete the table below. (4 marks)

Specialised cell	Main function
Red blood cell	
Root hair cell	
Sperm cell	
Palisade cell	

c) Explain **two adaptations** of a root hair cell that make it efficient in absorbing water and mineral salts. (2 marks)

i. _____

ii. _____

d) State **two advantages** of having specialised cells in multicellular organisms. (2 marks)

i. _____

ii. _____

15. A school health club conducted a survey on the eating habits of learners. They found that some learners frequently skipped breakfast and consumed mainly sugary snacks.

a) State **three classes of food nutrients** required by humans. (3 marks)

- i. _____
- ii. _____
- iii. _____

b) Explain **two effects** of inadequate protein intake in growing learners. (2 marks)

c) Describe how a learner can obtain a balanced diet from commonly available foods in Kenya. (3 marks)

d) Explain why excessive consumption of sugary foods may be harmful to health. (2 marks)

- i. _____

- ii. _____

16. A farmer observed that two similar plants were growing differently.

- i. *Plant A was placed in adequate sunlight and watered regularly, while*
- ii. *Plant B was kept in a dark room.*

a) Explain why Plant B developed weak, elongated and pale shoots. (3 marks)

- i. _____

- ii. _____

- iii. _____

b) Describe the process of **transpiration** in plants. (3 marks)

c) State **two factors** that affect the rate of transpiration. (2 marks)

- i. _____
- ii. _____

d) Explain the importance of transpiration to a plant. (2 marks)

17. During a school athletics competition, a learner ran several laps around the field. His breathing rate and heartbeat increased considerably.

a) Explain why the learner's breathing rate increased during the exercise. (3 marks)

b) Distinguish between **aerobic respiration** and **anaerobic respiration**. (2 marks)

c) State the products of aerobic respiration. (2 marks)

d) Explain why the learner continued breathing heavily for some time after completing the race. (3 marks)

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

CHEMISTRY

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

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2. Write the name of your school and your stream in the spaces provided.
3. Write your admission number and the date of the assessment in the spaces provided.
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SECTION N	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

1. A learner was investigating substances in the laboratory and recorded the following observations:

Substance P occupied a definite volume but took the shape of its container.

Substance Q had a definite shape and definite volume.

Substance R spread throughout the available space in a container.

a) Identify the state of matter represented by substance P.

(1 mark)

b) Identify the state of matter represented by substance Q.

(1 mark)

c) State one characteristic of the particles in substance R that enables it to spread throughout the container.

(1 mark)

2. An atom of element X has an atomic number of **17** and a mass number of **35**.

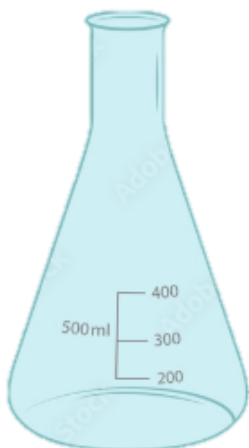
a) State the number of protons present in the atom. _____ (1 mark)

b) Calculate the number of neutrons in the atom. _____ (1 mark)

c) Write the electronic arrangement of element X. _____ (1 mark)

3. Study the simplified diagrams below.

A



B



C



- a) Identify apparatus **A**. _____ (1 mark)
- b) Identify apparatus **B**. _____ (1 mark)
- c) State one use of apparatus **C** in the chemistry laboratory. (1 mark)

4. The elements represented by the letters A, B and C have the following electronic arrangements:

☞ A: 2.8.1

☞ B: 2.8.7

☞ C: 2.8.8

- a) State the group to which element A belongs. (1 mark)

- b) State the group to which element B belongs. (1 mark)

- c) Explain why element C is chemically unreactive. (1 mark)

5. The grid below is part of the periodic table. Use it to answer the questions that follow:

(The letters are not the actual symbols).

							A	B
C	D					G		E
F								

Write down the formula of the compound formed between C and A.

- a. Which element has the same electron arrangement as the stable ion of:

(i) F _____

(ii) A _____

- b. Element Q has atomic number 15. Indicate its position on the grid.

c. Explain how the atomic radii of the following compare:

i. C and F

ii. C and D

d. Write the type of bond present in a compound formed between D and A.

e. Compound C and G were completely burned in oxygen.

i. Write down equations to show the combustion of each of the elements.

ii. State whether each of the oxides (i) above is basic or acidic.

6.

a. Study the table below and answer the questions that follow.

Particle	Atomic number	Ionic configuration	Formula of oxide	Atomic radii	Ionic radii
P	4			0.110	0.031
Q		2.8.8	QO	0.200	0.099
R		2.8.8	R ₂ O	0.230	0.133
S	17	2.8.8	S ₂ O ₇	0.099	0.181
T	16			0.104	0.231

i. Complete the table above

ii. From the table, choose the most reactive metal. Explain

iii. Which element is the most electronegative. Explain

iv. Using dots (.) and crosses (x) to represent electrons, show the bonding in the chloride of Q

v. Explain the solubility of element T in water

b.

i. Why is aluminium used to make utensils yet it is a reactive metal?

ii. Distinguish between valency and oxidation number

SECTION B: 50 MARKS

Answer ALL questions in this section.

7. The table below gives information about the ions T^+ and Z^{2-}

Ion	T^+	Z^{2-}
Electron arrangement	2.8	2.8.8
Number of neutrons	12	16

a. How many protons are there in the nucleus of ?

i. Element T? _____

ii. Element Z? _____

b. Determine the relative formula mass of the compound formed between T and Z

c. State two conditions under which the compound would conduct electricity

i. _____

ii. _____

8. The number of protons, neutrons and electrons in atoms A to F are given in the table below the letters do not represent the actual symbol of the elements:-

Atoms	Protons	Neutrons	Electrons
A	3	4	2
B	9	10	10
C	12	12	12
D	17	18	17
E	17	20	17
F	18	22	18

a. Choose from the table the letters that represent:

i. An atom of a metal . _____

ii. A neutral atom of a non-metal _____

iii. An atom of a noble gas . _____

iv. A pair of isotopes _____

v. A cation _____

9. A learner was given three colourless solutions labelled A, B and C. The learner carried out tests using universal indicator and obtained the following results.

Solution	Universal indicator colour	Approximate pH
A	Red	2
B	Green	7
C	Purple	13

a) Identify solution A as acidic, neutral or alkaline. _____ (1 mark)

b) Identify solution B as acidic, neutral or alkaline. _____ (1 mark)

c) Identify solution C as acidic, neutral or alkaline. _____ (1 mark)

d) Arrange the three solutions in order of increasing acidity. (2 marks)

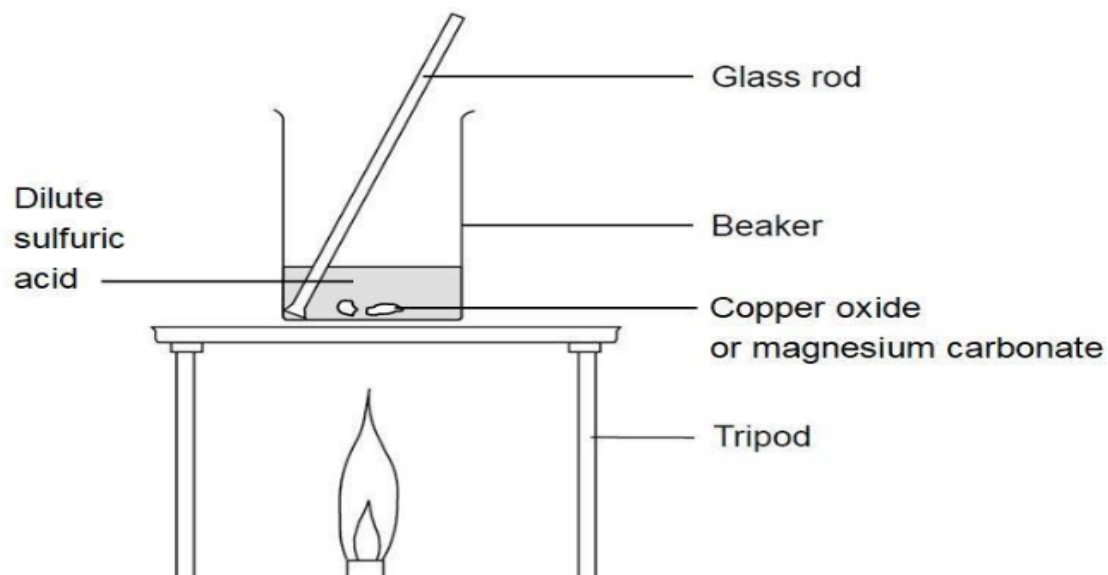
e) State the relationship between pH and acidity of a solution. (2 marks)

f) Name one natural indicator and one laboratory indicator that can be used to test whether a solution is acidic or alkaline. (2 marks)

g) State one use of indicators in everyday life or industry. (1 mark)

10. A learner prepared copper(II) sulfate crystals by reacting copper(II) oxide with dilute sulfuric acid.

The experimental arrangement is represented below.



a) Identify the apparatus used to heat the solution. (1 mark)

b) State the purpose of the glass rod during the experiment. (1 mark)

c) Describe how the learner would obtain pure copper(II) sulfate crystals from the solution after the reaction is complete. (3 marks)

d) Write a balanced chemical equation for the reaction between copper(II) oxide and sulfuric acid. (2 marks)

e) Explain why excess copper(II) oxide is removed before the crystals are obtained. (1 mark)

f) State one safety precaution necessary when carrying out this experiment. (1 mark)

g) Name the process by which the solid crystals are separated from the remaining liquid. (1 mark)

15. The following compounds belong to the same homologous series:

CH₄, C₂H₆, C₃H₈, C₄H₁₀

a) Name the homologous series represented by the compounds. **(1 mark)**

b) Give the name of the compound with the formula C₂H₆. **(1 mark)**

c) Give the name of the compound with the formula C₄H₁₀. **(1 mark)**

d) State the general formula of this homologous series. **(2 marks)**

e) State two characteristics of a homologous series. **(2 marks)**

f) Explain why members of a homologous series have similar chemical properties. **(1 mark)**

g) State one use of methane. **(1 mark)**

h) State one environmental concern associated with the combustion of hydrocarbons. **(1 mark)**

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

PHYSICS

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO LEARNERS

1. This paper consists of **TWO** sections: **A and B**.
2. Answer **ALL** questions in both sections.
3. Show **all working** in numerical questions.
4. Give answers to numerical questions to an appropriate number of significant figures where necessary.
5. Use the following values unless otherwise stated:
 - $g = 10 \text{ N/kg}$
 - Density of water = 1000 kg/m^3
 - Speed of light in vacuum = $3.0 \times 10^8 \text{ m/s}$
6. Non-programmable calculators may be used where necessary.

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SECTION A (30 MARKS)

Answer ALL questions in this section.

1. a) Define **Physics** as a science. (1 mark)

- b) State **two branches of Physics**. (2 marks)

i. _____

ii. _____

2. a) Explain why atmospheric pressure exists even though air cannot be seen. (1 mark)

- b) A diver is swimming at a depth of **8 m** below the surface of fresh water. Calculate the pressure exerted by the water on the diver. (2 marks)

3. A hydraulic lift has a small piston of area 0.02 m^2 and a large piston of area 0.8 m^2 .

- a) State the principle on which a hydraulic machine operates. (1 mark)

- b) A force of 150 N is applied to the small piston. Determine the force exerted by the large piston. (2 marks)

4. A spring has an original length of 20 cm. When a force of 15 N is applied, its length becomes 26 cm.

a) Determine the extension of the spring in metres. (1 mark)

b) Calculate the spring constant of the spring. (2 marks)

5. a) Distinguish between temperature and heat. (2 marks)

b) Explain why small gaps are left between sections of railway tracks. (1 mark)

6. A uniform metre rule is balanced at the 50 cm mark. A load of 20 N is suspended at the 20 cm mark.

a) State the principle of moments. (1 mark)

b) Calculate the force that must be suspended at the 80 cm mark to balance the metre rule.

(2 marks)

7. A learner of mass 60 kg climbs a staircase through a vertical height of 5 m in 10 seconds.

a) Calculate the work done against gravity. (1 mark)

b) Determine the average power developed by the learner. (2 marks)

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

a) Calculate the speed of the wave. (2 marks)

b) State one application of the Doppler effect. (1 mark)

9. a) What is meant by the half-life of a radioactive substance? (1 mark)

b) A radioactive sample has an initial mass of 160 g. Its half-life is 4 hours. Determine the mass remaining after 12 hours. (2 marks)

10. A resistor of resistance $6\ \Omega$ is connected across a 12 V supply.

a) Calculate the current flowing through the resistor. (1 mark)

- b) Calculate the electrical power dissipated by the resistor. (2 marks)

SECTION B: 50 MARKS

Answer ALL questions in this section.

11. A school science laboratory uses a hydraulic system to raise heavy equipment. The system consists of two pistons connected by an incompressible liquid.

The small piston has an area of 0.025 m^2 , while the large piston has an area of 0.50 m^2 .

- a) Explain why pressure applied to the liquid is transmitted throughout the liquid. (2 marks)

- b) A force of **180 N** is applied to the small piston. Calculate the pressure produced in the liquid. (2 marks)

- c) Determine the force exerted by the large piston. (2 marks)

- d) The large piston is required to raise a load of **3,000 N**. Determine the minimum force that must be applied to the small piston. (2 marks)

- e) Explain **two reasons** why hydraulic systems are preferred to direct mechanical lifting systems in some applications. (2 marks)

12. A learner investigates the extension of a metal wire by applying different loads. The wire has an original length of 2.0 m and a cross-sectional area of $1.5 \times 10^{-6} \text{ m}^2$.

When a force of 150 N is applied, the wire extends by 2.0 mm.

a) Define: (2 marks)

i. Stress

ii. Strain

b) Calculate the stress in the wire. (2 marks)

c) Calculate the strain produced in the wire. (2 marks)

d) Determine the Young's modulus of the material. (2 marks)

e) Explain why a material used for making a crane cable should have a high Young's modulus.

(2 marks)

13. A uniform beam of length 4.0 m and weight 200 N is supported at two points, A and B.

Point A is 0.5 m from the left end while B is 0.5 m from the right end.

A load of **600 N** is placed **1.0 m** from the left end of the beam.

a) State the two conditions necessary for a body to be in equilibrium. (2 marks)

- i.

- ii.

b) Calculate the clockwise moment produced by the **600 N** load about point A. (2 marks)

c) Determine the reaction force at B by taking moments about A. (3 marks)

d) Hence determine the reaction force at A. (1 mark)

e) Give **two practical applications** of the principle of moments. (2 marks)

14. A construction worker uses a pulley system to raise a 500 kg load through a vertical distance of 6 m. The effort applied to the machine is 1,250 N, and the effort moves through a distance of 30 m.

a) Calculate the useful work done in raising the load. (2 marks)

b) Calculate the work input to the machine. (2 marks)

c) Determine the efficiency of the machine. (2 marks)

d) Calculate the mechanical advantage of the machine. (2 marks)

e) Calculate the velocity ratio of the machine. (1 mark)

f) Explain why the efficiency of a real machine cannot normally be 100%. (1 mark)

15. (a) A sound wave has a frequency of 680 Hz and travels through air at 340 m/s.

Calculate its wavelength. **(2 marks)**

(b) A radioactive isotope has a half-life of 6 years. A sample initially contains 800 mg of the isotope.

Calculate the amount remaining after **18 years**. **(2 marks)**

(c) A battery has an electromotive force of 12 V and an internal resistance of 1 Ω . It is connected to an external resistor of 5 Ω .

i) Calculate the total resistance of the circuit. **(1 mark)**

ii) Determine the current supplied by the battery. **(1 mark)**

iii) Calculate the terminal potential difference of the battery. **(1 mark)**

(d) A community experiences increasingly frequent droughts and unusually high temperatures.

i) Explain the relationship between the greenhouse effect and climate change. (1 mark)

ii) State **one human activity** that increases the concentration of greenhouse gases. (1 mark)

iii) Suggest **one practical measure** the community can adopt to reduce its contribution to climate change. (1 mark)

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

INFORMATION COMMUNICATION TECHNOLOGY

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

1. Write your details as required in the spaces provided above.
2. This paper consists of two sections: A and B.
3. Answer all questions in section A and section B.
4. Answer the questions in English.
5. All answers **MUST** be written in the spaces provided in the paper.
6. Do **NOT** remove any page from this question paper.

FOR OFFICIAL USE ONLY (EXAMINER'S USE)

SECTION	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (35 MARKS)

Answer ALL questions in this section.

1. a) Define the term **Information and Communication Technology (ICT)**. (1 mark)

- b) State **two technologies used for communication** in modern society. (2 marks)

i. _____

ii. _____

- c) Explain **two ways in which ICT has improved communication in schools**. (2 marks)

i. _____

ii. _____

2. Study the simplified ICT infrastructure arrangement below.



a) Identify the component labelled **A**. (1 mark)

b) Identify **any two end-user devices** represented by E–J. (2 marks)

E: _____

F: _____

G: _____

H: _____

I: _____

J: _____

c) State **one function of device C** used to connect computers in an organisation. (1 mark)

d) Give **one reason why an organisation requires ICT infrastructure**. (1 mark)

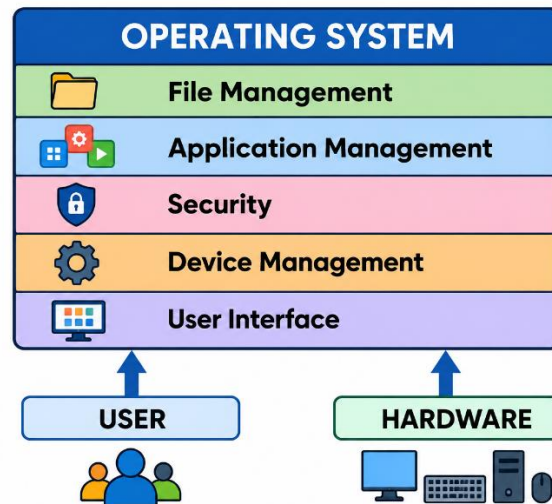
3. ICT is widely used in different sectors of society.

a) Name **three application areas of ICT**. (3 marks)

b) Explain **one benefit of ICT in the health sector**. (1 mark)

c) State **one way ICT can be used to support environmental conservation**. (1 mark)

4. Study the diagram below.



a) What is an **operating system**?

(1 mark)

b) Name **two operating systems** used in digital devices.

(2 marks)

i.

ii.

c) State **two functions of an operating system**.

(2 marks)

i.

ii.

5. A learner has created the following files on a computer:

ICT Notes.docx

ICT Presentation.pptx

ICT Poster.pub

ICT Assignment.docx

a) Suggest a suitable **folder name** in which the four files could be stored.

(1 mark)

b) State **two operations that can be performed on a file or folder** using an operating system.

(2 marks)

c) Give **two security measures** that can be used to protect files stored on a computer. **(2 marks)**

- i. _____
- ii. _____
- _____

6. a) Explain the meaning of **digital citizenship**. **(1 mark)**

b) State **two responsible behaviours** expected from a digital citizen. **(2 marks)**

- i. _____
- ii. _____

c) A learner receives a message from an unknown person requesting a password and personal information.

i) State **one danger associated with responding to the message**. **(1 mark)**

ii) Give **one appropriate action the learner should take**. **(1 mark)**

SECTION B: 50 MARKS

Answer ALL questions in this section.

7. A school has asked a learner to prepare a one-page notice using a word processor.

The notice should contain:

DIGITAL SKILLS CLUB

All Grade 10 learners are invited to join the Digital Skills Club. The club will help learners develop skills in word processing, presentations, desktop publishing, Internet research and digital communication.

a) Name **four word-processing features** that could be used to improve the appearance of the notice. **(4 marks)**

- i. _____
- ii. _____
- iii. _____
- iv. _____

b) Explain the difference between **editing** and **formatting** a document. (2 marks)

c) State **two advantages** of using a word processor instead of preparing the notice manually. (2 marks)

- i. _____
- ii. _____

d) Describe **two methods** of **correcting errors** in a word-processing document. (2 marks)

- i. _____
- ii. _____

8. A learner has been assigned to prepare a presentation entitled:

“Responsible Use of ICT in Schools”

The presentation is expected to contain **six slides**.

a) Suggest suitable content for **any four slides** of the presentation. (4 marks)

- i. _____
- ii. _____
- iii. _____
- iv. _____

b) State **three principles** of **designing an effective presentation**. (3 marks)

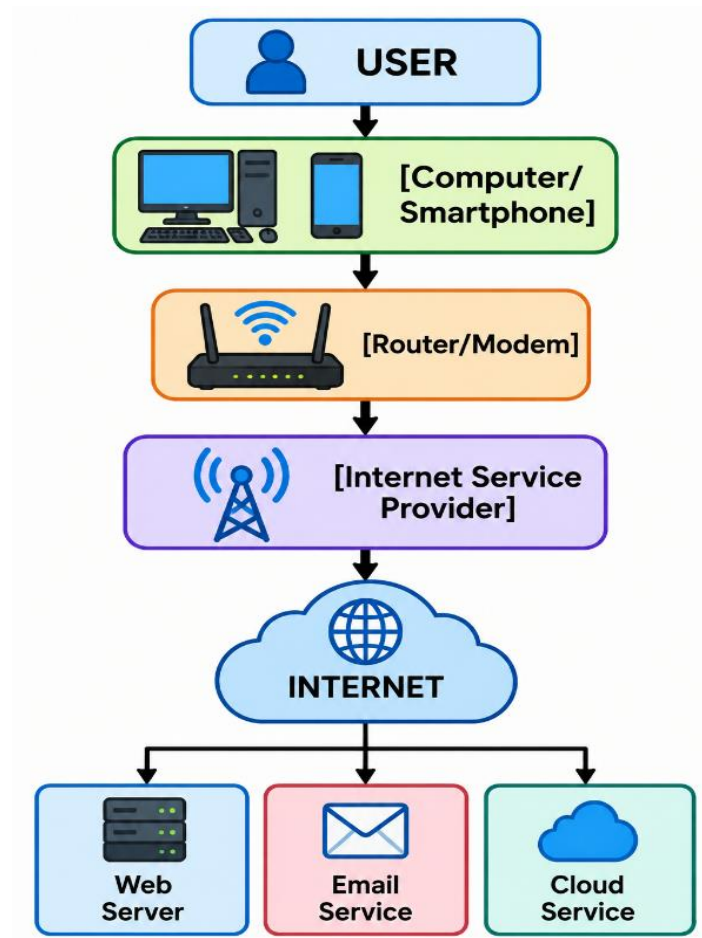
- i. _____
- ii. _____
- iii. _____

c) Explain why excessive use of **animations and transition effects** may reduce the effectiveness of a presentation. (1 mark)

d) Give **two ways** of **making a presentation accessible and easy to understand**. (2 marks)

- i. _____
- ii. _____
9. The school wants to produce a poster advertising an **ICT Innovation Exhibition**.
The poster should contain:
- School name
 - Exhibition title
 - Date
 - Venue
 - Activities
 - Contact information
- a) Define **desktop publishing**. (1 mark)
- _____
- _____
- b) Name **two types of publications** that can be produced using desktop publishing software.
(2 marks)
- i. _____
- ii. _____
- c) State **three design principles** that should be considered when creating the poster. (3 marks)
- i. _____
- ii. _____
- iii. _____
- d) Explain **two advantages of using desktop publishing software** when preparing school publications. (2 marks)
- i. _____
- _____
- ii. _____
- _____
- e) State **two pieces of information** that should appear prominently on the poster. (2 marks)
- i. _____
- ii. _____

10. Study the Internet communication process below.



a) What is the **Internet**? (1 mark)

b) Identify **two devices** that a user may use to access the Internet. (2 marks)

- i. _____
- ii. _____

c) State **three services or uses of the Internet**. (3 marks)

- i. _____
- ii. _____
- iii. _____

d) Explain **two factors** that should be considered when selecting an Internet connection for a school. (2 marks)

- i. _____
- _____

- ii. _____

- e) State **two responsible practices when using Internet search engines. (2 marks)**
- i. _____
- ii. _____
- 11.** A school plans to use digital communication technologies to connect teachers, learners and parents.
- a) Name **four digital communication technologies or platforms** that can be used for communication and collaboration. **(4 marks)**
- i. _____
- ii. _____
- iii. _____
- iv. _____
- b) Distinguish between **synchronous** and **asynchronous** digital communication. **(2 marks)**
- _____
- _____
- _____
- _____
- c) Give **two advantages of digital communication in education.** **(2 marks)**
- i. _____
- ii. _____
- d) State **two measures that can help ensure safe and responsible digital communication.** **(2 marks)**
- i. _____
- ii. _____
- _____

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

COMMUNITY SERVICE LEARNING

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

1. Write your name in the spaces provided above.
2. Write the name of your school and your stream.
3. Write your admission number and the date.
4. This paper consists of TWO sections: A and B.
5. Answer ALL questions in both sections.
6. Answer all questions in English.
7. All answers MUST be written in the spaces provided.
8. Do NOT remove any page from this paper.

FOR OFFICIAL USE ONLY (EXAMINER'S USE)

SECTION	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)**Answer ALL questions in this section.**

1. a) Define the term Community Service Learning (CSL). (2 marks)

b) State **two characteristics** of effective Community Service Learning. (2 marks)

i. _____

ii. _____

2.

A group of Grade 10 learners visits their community and discovers that the area around a public water point is dirty and poorly maintained.

a) Identify **one community need** presented in the situation. (1 mark)

b) State **two possible causes** of the problem. (2 marks)

i. _____

ii. _____

c) Suggest **one appropriate solution** that learners could undertake through Community Service Learning. (1 mark)

3. a) Name two values **that learners should demonstrate when participating in community service.** (2 marks)

i. _____

ii. _____

b) Explain how **one** of the values named above contributes to successful community service. (2 marks)

4. a) State two groups of people **who can participate in a community service project.** (2 marks)

i. _____

ii. _____

b) Give **two reasons** why involving community members is important in a service project.

(2 marks)

i. _____

ii. _____

5. During a community clean-up exercise, some learners disagree about how the work should be divided.

a) State **one appropriate way** of resolving the disagreement.

(1 mark)

b) Give **two benefits of teamwork** in Community Service Learning.

(2 marks)

i. _____

ii. _____

6. a) What is meant by reflection in Community Service Learning?

(2 marks)

b) State **two things a learner can gain from reflecting on a community service activity.**

(2 marks)

i. _____

ii. _____

7.

a) State **two responsibilities of a learner** participating in a community service project. (2 marks)

i. _____

ii. _____

b) Why should learners observe safety precautions during community service activities? (1 mark)

SECTION B: 50 MARKS

Answer ALL questions in this section.

8. Your school administration has asked Grade 10 learners to identify a problem affecting the surrounding community and develop a Community Service Learning project to address it.

a) State **two methods** learners could use to identify community needs. (2 marks)

i. _____

ii. _____

b) Give **three factors** learners should consider when selecting a community problem to address.

(3 marks)

i. _____

ii. _____

iii. _____

c) Outline **four steps** that learners should follow when planning the project. (4 marks)

i. _____

ii. _____

iii. _____

iv. _____

d) State **one reason** why setting clear objectives is important in a community project. (1 mark)

9. A Grade 10 class notices that plastic waste has accumulated around a nearby market. The waste blocks drainage channels and creates an unpleasant environment. The learners decide to work with traders and community leaders to address the problem.

a) Identify **two problems** resulting from the situation. (2 marks)

i. _____

ii. _____

b) Suggest **three activities** the learners could undertake to address the problem. (3 marks)

i. _____

ii. _____

iii. _____

c) Identify **two stakeholders** who should be involved in the project. (2 marks)

- i. _____
- ii. _____

d) Explain **two ways** in which the project could benefit the community. (2 marks)

- i. _____

- ii. _____

e) State **one indicator** that could be used to determine whether the project has been successful. (1 mark)

10. During a school-community project, the project leader assigns most of the work to a few learners. Other learners complain that the distribution of responsibilities is unfair. An argument develops among members of the group.

a) Identify **two qualities of an effective CSL project leader**. (2 marks)

- i. _____
- ii. _____

b) Explain **two ways** the leader could ensure fair distribution of responsibilities. (2 marks)

- i. _____

- ii. _____

c) State **three appropriate steps** that could be used to resolve the conflict. (3 marks)

- i. _____
- ii. _____
- iii. _____

d) Explain **two ways** teamwork can improve the success of a community project. (2 marks)

- i. _____

- ii. _____

e) State **one consequence** of failing to resolve conflicts in a community project. **(1 mark)**

11. A group of learners is conducting a Community Service Learning project in a nearby village. During the project, one learner takes photographs of community members and posts them on social media without seeking their permission.

a) Identify **one ethical issue** in the situation. **(1 mark)**

b) Explain **two reasons** why learners should respect the privacy and dignity of community members. **(2 marks)**

i. _____

ii. _____

c) State **three values** that should guide learners when interacting with community members. **(3 marks)**

i. _____
ii. _____

iii. _____

d) Suggest **two appropriate actions** the learner should take after posting the photographs without permission. **(2 marks)**

i. _____
ii. _____

e) Explain **two ways** Community Service Learning promotes responsible citizenship. **(2 marks)**

i. _____

ii. _____

12.

Your class has completed a Community Service Learning project aimed at improving sanitation in the local community.

a) State **three ways** learners can evaluate the success of the project. **(3 marks)**

- i. _____
- ii. _____
- iii. _____

b) Give **two examples of evidence** that could be collected to show that the project achieved its objectives. **(2 marks)**

- i. _____
- ii. _____

c) Explain **two lessons** learners may gain from participating in the project. **(2 marks)**

- i. _____
- ii. _____

d) State **one challenge** that learners may have experienced during the project. **(1 mark)**

e) Suggest **one way** of addressing the challenge identified in (d). **(1 mark)**

f) Why is it important for learners to share the results of a completed community project with relevant stakeholders? **(1 mark)**

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

ENGLISH

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

1. Answer **ALL** questions.
2. Write your answers clearly in the spaces provided.
3. Read each question carefully before answering.
4. Give complete and grammatically correct answers where required.
5. This examination consists of **TWO** sections:
 - **Section A: Reading and Comprehension – 30 marks**
 - **Section B: Grammar and Functional Writing – 50 marks**

FOR OFFICIAL USE ONLY (EXAMINER'S USE)

SECTION	A	B	C	D	E	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	10 MARKS	20 MARKS	25 MARKS	5 MARKS	20 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS							8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE														

SECTION A: 30 MARKS

TASK 1: COMPREHENSION – 10 MARKS

Read the passage below and answer the questions that follow.

When learners at **Bomet Senior School** realised that the school kitchen spent a considerable amount of money buying vegetables, they began discussing ways of reducing the cost. The Agriculture Club proposed establishing a school farm where vegetables could be grown for use in the kitchen.

The idea was introduced by **Janet**, the club's vice-chairperson, during one of their weekly meetings. She explained that the school had unused land behind the laboratory that could be converted into a productive garden. The agriculture teacher, **Mr. Rono**, encouraged the learners to study the soil and determine which crops would perform well.

After conducting a simple investigation, the learners selected vegetables such as kale, spinach and onions. They prepared the land, constructed a small compost pit and planted the crops. They also collected dry leaves and other biodegradable materials to make organic manure.

However, the project soon faced difficulties. There was insufficient water during a particularly dry period, and some seedlings withered. Rather than abandoning the project, the learners discussed possible solutions. They decided to collect water from the laboratory roof and use it carefully on the garden.

The school administration supported their efforts by providing a few watering cans. Parents also donated seeds, while the learners continued making compost from available organic materials. After several weeks, the garden began producing vegetables. The kitchen used some of the harvest, while the learners sold the surplus to teachers. The money earned was used to purchase additional seeds and gardening tools.

The project eventually became more than a source of vegetables. It taught the learners that careful planning, innovation and teamwork can transform an unused resource into something valuable.

Questions

1. Why did the learners decide to establish a school farm? (2 marks)

2. Name **TWO** vegetables grown by the learners. (2 marks)

(i) _____

(ii) _____

3. What problem affected the project during the dry period? (1 mark)

4. How did the learners respond to the shortage of water? (1 mark)

5. State **TWO** ways in which the school community supported the project. (2 marks)

(i) _____

(ii) _____

6. What important lesson did the learners gain from the project? (2 marks)

TASK 2: CLOZE TEST – 10 MARKS

Read the passage below and fill in each blank with the most appropriate word.

THE PEER MENTORING PROGRAMME

At **Kisii Senior School**, a group of learners established a peer mentoring programme to help students who were experiencing difficulties in adapting to senior school life.

The programme was started (1) _____ a group of learners who believed that students could support one another. Before becoming mentors, the learners received guidance from the school counsellor (2) _____ effective communication and confidentiality.

During the first meeting, the mentors explained (3) _____ the programme would operate. They assured the younger learners that their concerns would be treated (4) _____ respect and sensitivity.

One learner admitted that she was struggling to manage her time. Her mentor helped her prepare a timetable (5) _____ included time for study, rest and recreation.

Another learner needed help (6) _____ he was finding it difficult to balance schoolwork with responsibilities at home.

The mentors did not make decisions for their fellow learners. Instead, they encouraged them to think carefully (7) _____ possible solutions. When a problem required professional assistance, the mentors referred the learner (8) _____ the appropriate teacher or counsellor.

After several weeks, teachers noticed that many participants had become more confident. The mentors themselves also developed better listening and leadership skills. The programme therefore benefited both those who received support (9) _____ those who provided it.

The school administration encouraged the learners to continue with the programme because cooperation and empathy are qualities (10) _____ can strengthen a school community.

TASK 3: COMPREHENSION – 10 MARKS

Read the passage below and answer the questions that follow.

THE SCHOOL DEBATE

The auditorium at **Kakamega Senior School** was unusually quiet as members of the Debate Club prepared for an inter-school competition. Their topic was whether schools should completely ban the use of mobile phones by learners.

The debate chairperson, **Samuel**, reminded everyone that the purpose of the discussion was not simply to defeat the opposing side. Instead, learners were expected to present convincing arguments while respecting different opinions.

Faith, who supported the ban, argued that unrestricted phone use could distract learners from their studies. She gave examples of students who spent long periods on social media during study time.

Daniel, however, disagreed. He argued that mobile phones could be useful educational tools when used responsibly. According to him, learners could access electronic books, educational videos and online research materials.

As the discussion became more intense, some members began interrupting one another. Samuel raised his hand and waited until the room became quiet. He reminded the members to allow speakers to finish before responding.

The team eventually agreed that the issue was more complicated than simply banning or allowing phones. They proposed that schools should establish clear rules governing when and how mobile phones could be used for educational purposes.

Before the meeting ended, Samuel asked each member to write down one argument supporting the team's final position. He explained that a strong debate depended not only on speaking confidently but also on listening, evaluating evidence and modifying one's position when necessary.

Questions

1. What was the topic of the debate? (1 mark)

2. Give **TWO** arguments presented in the debate. (2 marks)

3. Why did Samuel raise his hand during the discussion? (1 mark)

4. What compromise did the team eventually reach? (2 marks)

5. Explain in your own words the meaning of the statement:

“A strong debate depended not only on speaking confidently but also on listening.” (2 marks)

6. Identify **TWO** skills demonstrated by Samuel as the chairperson. (2 marks)

SECTION B: 50 MARKS

TASK 4: GRAMMAR IN USE – 30 MARKS

Answer **ALL** questions in this task.

1. Identify the word class of each underlined word.

The **successful** learners **quickly** completed the task **before** sunset.

- a) successful – _____ (1 mark)
- b) quickly – _____ (1 mark)
- c) before – _____ (1 mark)

2. Use the word “light” in two different sentences, using it as indicated.

a) As a noun: (1 mark)

b) As an adjective: (1 mark)

3. Fill in the blank with an appropriate pronoun.

Jane and Asha completed the project by _____. (1 mark)

4. Identify the type of phrase underlined.

The learners completed the assignment with remarkable accuracy. (1 mark)

5. Rewrite the sentence by replacing the underlined words with an appropriate adverb.

The speaker answered the question in a polite manner. (1 mark)

6. Construct one meaningful sentence containing an adjectival phrase. (1 mark)

7. Identify the grammatical function of the underlined phrase.

The committee selected the most responsible learner as its representative. (1 mark)

8. Arrange the following words to form a meaningful noun phrase.

Kenyan / talented / three / young / musicians (1 mark)

9. Identify the type of clause in bold.

The learners continued working **although they were extremely tired**. (1 mark)

10. Complete the sentence using an appropriate subordinate clause.

The teacher postponed the practical lesson _____ (1 mark)

11. Join the two sentences using a suitable relative pronoun.

The girl won the essay competition. She represented our school. **(1 mark)**

12. Identify the independent clause in the sentence below.

If the weather improves, the agricultural club will resume its activities. **(1 mark)**

13. Rewrite the sentence by changing the dependent clause into a phrase without changing the meaning.

When the lesson ended, the learners left the classroom. **(1 mark)**

14. State whether the following sentence is simple, compound or complex.

The learners completed the experiment, but they forgot to record the results. **(1 mark)**

15. Join the two sentences using an appropriate conjunction.

The road was flooded. The students arrived at school on time. **(1 mark)**

16. Rewrite the sentence in the passive voice.

The science club members planted fifty trees. **(1 mark)**

17. Rewrite the sentence in the active voice.

The school garden was maintained by the agriculture club.

(1 mark)

18. Rewrite the sentence in reported speech.

Amina said, "I have completed my assignment."

(1 mark)

19. Rewrite the sentence beginning with the word given.

The learners would have won the competition if they had prepared adequately. (1 mark)

Begin:

Had

20. Rewrite the sentence using too...to without changing its meaning.

The box was so heavy that the learner could not lift it.

(1 mark)

Begin:

The box was

21. Add a suitable question tag.

You attended the environmental seminar, _____? (1 mark)

22. Correct the grammatical errors in the following sentences.

a) The list of participants **were** submitted yesterday. (1 mark)

b) Neither the students nor the teacher **know** the answer. (1 mark)

23. Rewrite the following sentence using correct punctuation and capitalisation.
the principal asked jane where she had placed the laboratory keys (2 marks)

24. Correct the spelling errors in the sentence below.

The learners showed great **determination** and **responsiblity** during the campaign. (2 marks)

TASK 5: FUNCTIONAL WRITING – 20 MARKS

Your school has announced that it will select **two Grade 10 learners to represent the school in a county-level Young Innovators Exhibition.**

The exhibition will provide learners with an opportunity to present practical solutions to community problems.

You are interested in participating because you have developed an idea for a simple project that can help your community.

You are **Kevin Kiptoo**, a Grade 10 learner at **Fiti Senior School**.

TASK

Write a **formal application letter to the Principal of Fiti Senior School** requesting to be selected as one of the school's representatives.

Your letter should include:

- your address;
- the date;
- the recipient's address;
- an appropriate salutation;
- a clear subject/reference;
- the purpose of the letter;
- the innovation/project you wish to present;
- relevant skills or qualities you possess;
- reasons why you should be selected;
- a suitable conclusion;
- appropriate formal language and paragraphing.

(20 marks)

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

KISWAHILI

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

MAELEKEZO KWA WANAFUNZI

1. Andika jina lako katika nafasi ulizopewa hapo juu.
2. Andika jina la shule yako na darasa lako katika nafasi ulizopewa.
3. Andika nambari yako ya usajili na tarehe ya tathmini katika nafasi ulizopewa.
4. Karatasi hii ina sehemu mbili: A na B.
5. Jibu maswali yote katika sehemu A na sehemu B.
6. Jibu maswali kwa lugha ya Kiswahili.
7. Majibu yote LAZIMA yaandikwe katika nafasi ulizopewa kwenye karatasi hii.
8. USIONDOE ukurasa wowote kutoka kwenye karatasi hii ya maswali.

ALAMA ZA MWANAFUNZI

SEHEMU	SEHEMU A	SEHEMU B	ASILIMIA (%)	KUZ 1	KUZ 2	KUF 1	KUF 2	KUK 1	KUK 2	CHI 1	CHI2
KIWANGO CHA ALAMA	ALAMA 30	ALAMA 50		90- 100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTI			8 POINTI	7 POINTI	6 POINTI	5 POINTI	4 POINTI	3 POINTI	2 POINTI	1 POINTI	
JUMLA YA ALAMA ZA MWANAFUNZI											

SEHEMU A: ALAMA 50**KAZI YA 1: UFAHAMU Alama 10****1. Soma kifungu hiki kisha ujibu maswali yanayofuata.**

Teknolojia imekuwa sehemu muhimu ya maisha ya binadamu katika karne ya ishirini na moja. Katika sekta ya elimu, matumizi ya vifaa vya kidijitali yamebadilisha namna wanafunzi wanavyopata na kutumia maarifa. Hapo awali, mwanafunzi alitegemea zaidi vitabu vya kiada na maelezo ya mwalimu darasani. Leo hii, mwanafunzi anaweza kupata taarifa kutoka kwenye maktaba za kidijitali, tovuti za kielimu, video na programu mbalimbali za kujifunzia.

Matumizi ya teknolojia shuleni yana manufaa mengi. Kwanza, humwezesha mwanafunzi kupata taarifa kwa haraka. Pili, huleta mazingira ya kujifunza yenye kuvutia kwa kutumia picha, sauti, video na michoro. Tatu, teknolojia huwawezesha wanafunzi kushirikiana katika miradi hata kama hawako sehemu moja. Kwa mfano, wanafunzi wanaweza kutumia majukwaa ya mtandao kufanya utafiti na kuandaa kazi za pamoja.

Hata hivyo, teknolojia inapaswa kutumiwa kwa uwajibikaji. Baadhi ya wanafunzi hutumia vifaa vya kidijitali kwa shughuli zisizohusiana na masomo. Wengine huamini kila taarifa wanayopata kwenye mtandao bila kuichunguza. Hali hii inaweza kusababisha upotoshaji wa taarifa. Kwa hiyo, mwanafunzi anapaswa kuwa na uwezo wa kutathmini chanzo cha taarifa kabla ya kuitumia.

Walimu na wazazi pia wana jukumu la kuwaongoza vijana katika matumizi salama ya teknolojia. Wanafunzi wanapaswa kufundishwa namna ya kulinda taarifa zao binafsi, kuheshimu haki za wengine na kutumia mitandao kwa mawasiliano yenye kujenga. Teknolojia ikitumiwa vizuri, inaweza kuwa chombo muhimu cha kukuza ubunifu, utafiti na maendeleo ya kielimu.

Maswali

a) Taja **manufaa mawili** ya teknolojia katika elimu yaliyotajwa katika kifungu. **(2 alama)**

b) Eleza kwa nini mwanafunzi hapaswi kuamini kila taarifa anayopata kwenye mtandao. **(2 alama)**

c) Taja njia **mbili** ambazo wanafunzi wanaweza kutumia teknolojia kushirikiana katika masomo.

(2 alama)

d) Eleza majukumu mawili ya walimu na wazazi katika matumizi ya teknolojia. (2 alama)

e) Pendekeza njia mbili ambazo mwanafunzi anaweza kutumia ili kuwa mtumiaji mwajibikaji wa teknolojia. (2 alama)

KAZI YA 2: Alama 10

2. Jaza nafasi zilizoachwa wazi kwa neno linalofaa ili kukamilisha kifungu hiki.

UHIFADHI WA MAZINGIRA

Mazingira ni sehemu muhimu ya maisha ya binadamu. Kila mtu ana wajibu wa

_____ (a) mazingira yake ili yaendeleo kuwa safi na salama. Misitu hutupatia hewa safi na husaidia _____ (b) mmomonyoko wa udongo. Kwa sababu hiyo, ni muhimu kupanda _____ (c) na kuzuia ukataji wa miti kiholela.

Katika jamii nyingi, taka zimekuwa _____ (d) kubwa la kimazingira. Taka zisiposimamiwa vizuri zinaweza _____ (e) mazingira na kusababisha magonjwa. Wananchi wanapaswa kutenganisha taka zinazoweza _____ (f) kutoka kwa zile zisizoweza kutumika tena.

Shule pia zina nafasi muhimu katika uhifadhi wa mazingira. Wanafunzi wanaweza kuanzisha miradi ya _____ (g) miti, kusafisha mazingira na kuelimisha jamii kuhusu umuhimu wa mazingira. Aidha, maji yanapaswa kutumiwa kwa _____ (h) ili kuzuia upotevu wake.

Ni wajibu wa kila mwananchi kuwa _____ (i) wa mazingira. Tukishirikiana, tutaweza kujenga mazingira _____ (j) kwa kizazi cha sasa na kijacho.

KAZI YA 3: SARUFI NA MSAMIATI Alama 30

3. Taja aina ya neno lililopigiwa mstari katika kila sentensi.

a) **Wanafunzi** walifanya utafiti kuhusu teknolojia. (1 alama)

b) Mwalimu aliwaeleza wanafunzi jambo **hilo**. (1 alama)

c) Wakulima walipanda mazao **mengi** msimu huu.

(1 alama)

d) Vijana **walishirikiana** katika mradi huo.

(1 alama)

e) Mti **ule** ulikuwa mrefu sana.

(1 alama)

f) Wanafunzi walifanya kazi **kwa bidii**.

(1 alama)

4. Andika sentensi zifuatazo katika **wingi** bila kubadilisha maana.

a) Kitabu hiki kimepotea.

(2 alama)

b) Mti huu umeanguka.

(2 alama)

c) Jembe lile limevunjika.

(2 alama)

5. Badilisha vitenzi vilivyopigiwa mstari kulingana na maagizo.

a) Wanafunzi **wanasoma** vitabu vya Kiswahili.

Badilisha kuwa **wakati uliopita**. (2 alama)

b) Mkulima **alipanda** miti mingi.

Badilisha kuwa **wakati ujao**. (2 alama)

c) Vijana **watashiriki** katika kampeni ya mazingira.

Badilisha kuwa **wakati uliopo. (2 alama)**

6. Andika sentensi zifuatazo katika hali ya **ukanushaji**.

a) Wanafunzi wamefanya usafi wa mazingira. **(2 alama)**

b) Mkulima atapanda miti kesho. **(2 alama)**

7. Andika kitenzi kilichomo kwenye mabano katika kauli uliyopewa.

a) Mama alim_____ mtoto chakula.

(–lish–)

Kauli ya kutendea (2 alama)

b) Wanafunzi wal_____ taarifa muhimu.

(–andik–)

Kauli ya kutendwa (2 alama)

8. Toa neno lenye maana sawa na lile lililopigiwa mstari.

a) Teknolojia imeleta **mabadiliko** makubwa katika elimu. **(1 alama)**

b) Wanafunzi wanapaswa kuwa **waangalifu** wanapotumia mtandao. **(1 alama)**

c) Jamii inapaswa **kuhifadhi** mazingira. **(1 alama)**

d) Taarifa hiyo ilikuwa **ya kweli**. **(1 alama)**

SEHEMU B: ALAMA 30; KAZI YA 4: UFAHAMU Alama 10

9. Soma kifungu hiki kisha ujibu maswali yanayofuata.

UMUHIMU WA MIMEA NA WANYAMA

Mimea na wanyama ni sehemu muhimu ya mfumo wa mazingira. Mimea hutupatia oksijeni, chakula, dawa na malighafi zinazotumiwa katika viwanda mbalimbali. Miti pia husaidia kuhifadhi udongo na maji. Misitu inapohifadhiwa vizuri, huwa makazi ya viumbe wengi na huchangia katika kudhibiti mabadiliko ya tabianchi.

Wanyama nao wana umuhimu mkubwa katika mazingira na maisha ya binadamu. Baadhi yao hutupatia chakula, ngozi na bidhaa nyingine. Wanyama wa porini huvutia watalii na hivyo kuchangia mapato ya taifa. Aidha, wanyama mbalimbali hushiriki katika usawazishaji wa mfumo wa ikolojia.

Hata hivyo, shughuli za binadamu kama ukataji wa miti, uwindaji haramu, uchafuzi wa mazingira na upanuzi wa makazi zimeathiri mimea na wanyama. Baadhi ya viumbe viko katika hatari ya kutoweka. Ili kukabiliana na hali hii, jamii inapaswa kushirikiana na serikali katika kuhifadhi misitu, kulinda wanyamapori na kutumia maliasili kwa njia endelevu.

Maswali

a) Taja manufaa mawili ya mimea kwa binadamu. **(2 alama)**

b) Eleza namna wanyama wa porini wanavyosaidia uchumi wa taifa. **(2 alama)**

c) Taja shughuli mbili za binadamu zinazohatarisha mimea na wanyama. **(2 alama)**

d) Eleza maana ya kutumia maliasili kwa njia **endelevu**. **(2 alama)**

e) Pendekeza hatua mbili ambazo jamii inaweza kuchukua ili kuhifadhi mimea na wanyama.

(2 alama)

KAZI YA 5: INSHA Alama 20**10. Jibu swali moja pekee.****A.**

Anza insha yako kwa sentensi ifuatayo na uendeleze hadithi kwa mtiririko mzuri:

“Nilipofika shuleni asubuhi hiyo, niligundua kuwa kulikuwa na jambo lisilo la kawaida...”

Andika insha ya **maneno 250–300**.

(20 alama)

AU**B.**

Endeleza insha kwa kutumia sentensi hizi kama mwanzo:

“Teknolojia inaweza kubadilisha maisha ya kijana kwa njia nyingi. Hata hivyo, matumizi yake yanahitaji uwajibikaji...”

Andika insha yenye mtiririko mzuri kuhusu **matumizi bora ya teknolojia na vijana**.

Insha yako iwe ya **maneno 250–300**.

(20 alama)

HUU NDIO UKURASA WA MWISHO ULIOPIGWA CHAPA

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

ESSENTIAL MATHEMATICS

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

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5. Show all working clearly where necessary.
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FOR OFFICIAL USE ONLY (EXAMINER'S USE)

SECTION	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)**Answer ALL questions in this section.**

1. The population of a local town increases by an index factor represented by

$$2^3 \times 4^2 \times 8^{-1}.$$

- (a) Express 4^2 and 8^{-1} as powers of 2. (1 mark)

- (b) Using the laws of indices, simplify $2^3 \times 4^2 \times 8^{-1}$ to a single integer value. (2 marks)

2. Consider the quadratic expression $3x^2 - 11x - 4$.

- (a) Factorise the expression completely. (2 marks)

- (b) Hence, solve the equation $3x^2 - 11x - 4 = 0$. (1 mark)

3. A **sector** of a circular water tank has a radius of 14 cm and subtends an angle of 135° at the centre.

Calculate the area of the sector.

- Take $\pi = \frac{22}{7}$. (3 marks)

4. A trader buys a watch in the United States for **USD 120**. On returning to Kenya, she sells the watch at a profit of 25%.

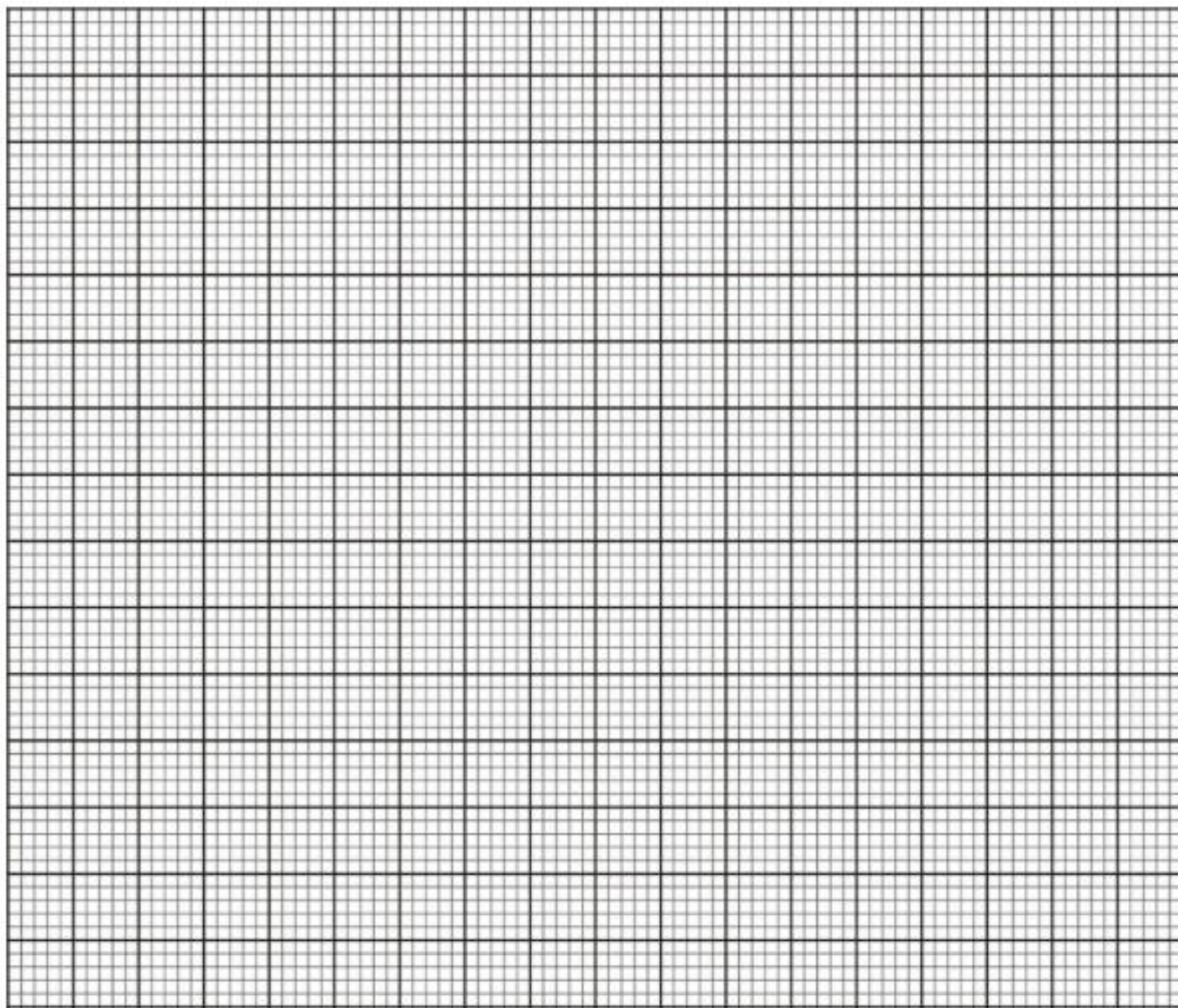
Given that the exchange rate is $1 \text{ USD} = 130 \text{ KES}$, calculate the selling price of the watch in **Kenya Shillings (KES)**. **(4 marks)**

5. A vertical pole stands on level ground. From a point 15 m from the base of the pole, the angle of elevation to the top of the pole is 38° .

Calculate the height of the pole, correct to **2 decimal places**. **(3 marks)**

6. Point $P(3, -2)$ is reflected in the line $y = x$ to obtain the image P' . The point P' is then enlarged about the origin $(0,0)$ using a linear scale factor of -2 , producing the final image P'' .

Determine the coordinates of:



(a) P' (2 marks)

(b) P'' (2 marks)

7. A solid right circular cone has a base radius of 6 cm and a slant height of 10 cm.

Calculate the **total surface area** of the cone in terms of π .

(3 marks)

8. A fair six-sided die and a standard fair coin are tossed simultaneously.

(a) Draw a sample-space diagram showing all possible outcomes.

(1 mark)

(b) Determine the probability of obtaining an **even number on the die and a Head on the coin**.

(2 marks)

9. Classify each of the following numbers as either **Rational** or **Irrational**. Give a reason for each answer.

(a) $\sqrt{18}$ (2 marks)

(b) 0.333 ... (2 marks)

SECTION B: 50 MARKS**Answer ALL questions in this section.**

- 10.** Two similar conical water tanks have heights in the ratio
2: 5.

(a) State the linear scale factor from the smaller tank to the larger tank. **(1 mark)**

(b) The surface area of the base of the smaller tank is 48 cm^2 . Calculate the surface area of the base of the larger tank. **(3 marks)**

(c) The larger tank has a maximum capacity of 625 litres.

(i) Calculate the maximum capacity of the smaller tank in litres. **(3 marks)**

(ii) Water is pumped into the smaller tank at a constant rate of 0.5 litres per second. Calculate the time, in minutes, required to fill the smaller tank completely from empty. **(3 marks)**

11. A landowner plans to construct a rectangular garden. The length of the garden is $(2x + 3)$ m and its width is $(x - 1)$ m.

(a) Write an expression for the area A of the garden in terms of x . **(2 marks)**

(b) The total area of the garden is 45 m^2 .

(i) Form a quadratic equation in x and show that it simplifies to $2x^2 + x - 48 = 0$. **(2 marks)**

(ii) Solve the quadratic equation to obtain the possible value of x . **(4 marks)**

(iii) Hence, state the actual length and width of the garden. **(2 marks)**

12. A surveyor maps a triangular piece of land ABC . The measurements obtained are $AB = 8$ km, $AC = 11$ km and $\angle BAC = 62^\circ$.

(a) Calculate the area of the triangular piece of land ABC , correct to 2 decimal places. (3 marks)

(b) Calculate the length of BC , correct to 2 decimal places.

(4 marks)

(c) A drone is positioned 2 km vertically above point A . Calculate the angle of elevation of the drone as viewed from point B , correct to an appropriate degree of accuracy. (3 marks)

13. A bag contains **5 red balls and 3 blue balls**. Two balls are drawn from the bag, one after another, **without replacement**.

(a) Draw a fully labelled tree diagram showing all possible outcomes and the corresponding probabilities. **(4 marks)**

(b) Calculate the probability that:

(i) Both balls drawn are red. **(2 marks)**

(ii) The two balls drawn are of different colours. **(2 marks)**

(iii) At least one blue ball is drawn. **(2 marks)**

14. A mathematics investigation recorded the scores of **40 Grade 10 students** in a mental arithmetic test marked out of 10.

The scores were:

4	7	5	6	8	5	4	9	6	5
7	6	5	8	4	6	7	5	10	6
5	9	6	4	7	6	5	8	6	5
6	5	7	6	4	8	7	6	5	9

(a) Construct a frequency distribution table for the ungrouped data using the headings:

Score (x), Tally, Frequency (f), fx .

(4 marks)

(b) State the modal score. (1 mark)

(c) Calculate the mean score of the students.

(3 marks)

(d) Determine the probability that a student selected at random scored **at least 7 marks**. (2 marks)

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

CORE MATHEMATICS

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

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LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. Use logarithm tables to evaluate, correct to 4 significant figures:

$$\frac{1.24 \times 10^{-1.0456}}{3.82}$$

2. Solve for x in the index equation: $8^{x-1} \times 4^{2x+1} = 32^x$

3. Triangle ABC has side lengths $AB = 7$ cm, $BC = 9$ cm and $\angle ABC = 120^\circ$. Calculate the **exact area** of the triangle, leaving your answer in the form $a\sqrt{b}$ where a and b are rational numbers.

4. An annular metal washer has an outer radius of 8.4 cm and an inner radius of 5.6 cm.

Taking $\pi = \frac{22}{7}$, calculate the **surface area of one face** of the washer.

5. The position vectors of points P and Q , relative to the origin, are $p = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$ and $q = \begin{pmatrix} -5 \\ 4 \end{pmatrix}$ respectively.

Find the magnitude of the vector $\overrightarrow{PQ}$, leaving your answer in **simplified surd form**.

6. A particle accelerates uniformly from rest and covers a displacement of 180 m in 12 seconds along a straight line.

Determine its velocity at the end of the **12 seconds**.

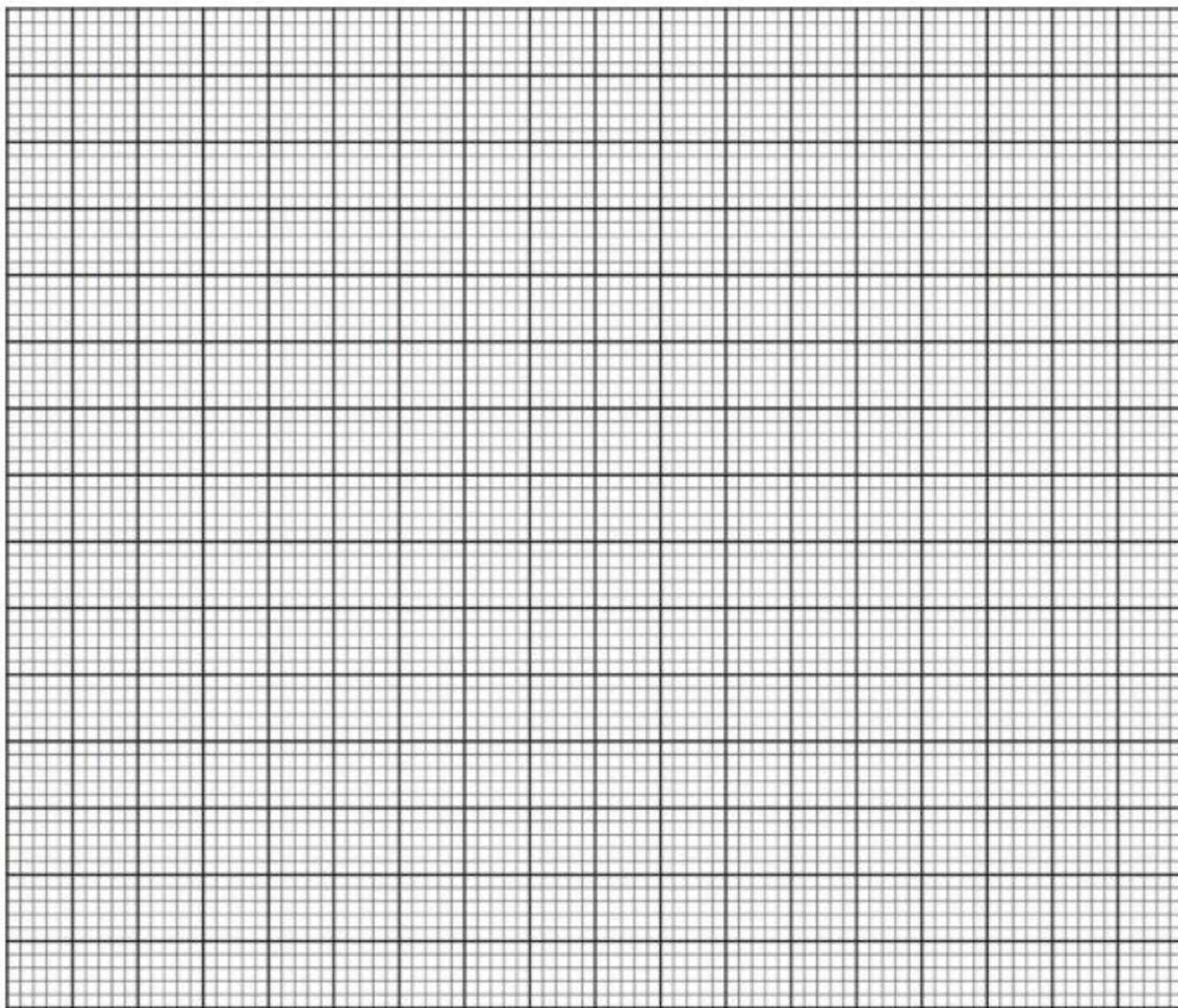
7. A quadrilateral $ABCD$ has side lengths

$AB = 6$ cm, $BC = 8$ cm, $CD = 10$ cm, $DA = 12$ cm, and diagonal $AC = 10$ cm.

Calculate the area of quadrilateral $ABCD$, correct to **2 decimal places**, using **Heron's formula** for each triangular component.

8. Point $A'(2, -5)$ is the image of $A(-4, 3)$ under a reflection across line L .

(a) Find the coordinates of the midpoint of AA' .



(b) Determine the equation of the mirror line L in the form

$$y = mx + c.$$

9. A bag contains 4 red balls and 6 blue balls.

Two balls are picked at random, one after another, **without replacement**.

(a) Draw a tree diagram to represent this experiment.

(b) Calculate the probability that **at least one red ball** is selected.

SECTION B (50 MARKS)

Answer ALL questions in this section.

10. A sector of a circle with radius $r = 12$ cm subtends an angle of $\theta = 105^\circ$ at the centre O .

Points A and B lie on the arc such that $OA = OB = 12$ cm.

(a) Calculate the area of the sector OAB .

Take $\pi = 3.142$. [2 Marks]

(b) Calculate the area of triangle OAB .

[3 Marks]

(c) Determine the area of the minor segment bounded by the chord AB and the arc AB . [2 Marks]

(d) A concentric inner circle creates an annulus of width **3 cm** within the main circle.

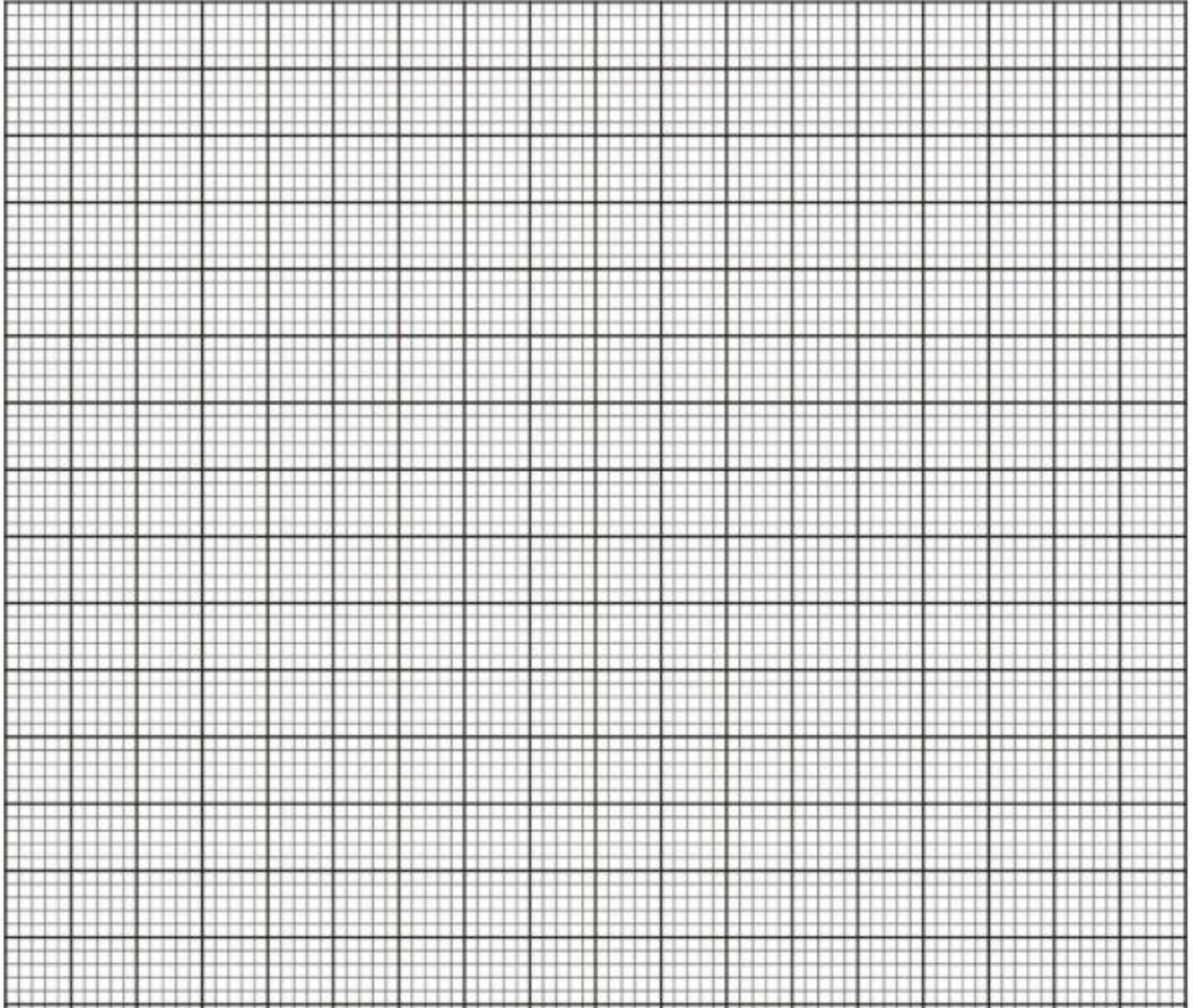
Calculate the area of the annular sector formed between the same radial lines OA and OB . [3

Marks]

11. Triangle PQR has vertices $P(1, 2)$, $Q(4, 2)$, $R(3, 5)$.

(a) Triangle PQR undergoes an enlargement with centre $C(0,0)$ and linear scale factor $k = -2$ to form image $P'Q'R'$.

State the coordinates of P' , Q' , and R' . [3 Marks]



(b) Triangle $P'Q'R'$ is then rotated through $+90^\circ$ about the origin $(0,0)$ to map onto triangle $P''Q''R''$.

Determine the coordinates of P'' , Q'' , and R'' . [3 Marks]

(c) Describe fully a **single transformation** that maps triangle PQR directly onto triangle $P''Q''R''$. [4 Marks]

12. Two cars, X and Y , start moving along a straight highway from town A towards town B , which is 240 km away. Car X leaves at 08:00 AM, travelling at a constant speed of 60 km/h. Car Y leaves town A at 08:30 AM, travelling at a constant speed of 80 km/h.
- (a) Express the distance covered by each car as a function of time t , in hours, after 08:00 AM. [2 Marks]
- (b) Calculate the time of day when Car Y overtakes Car X . [3 Marks]
- (c) How far from town A does the overtaking take place? [2 Marks]
- (d) If Car X experiences a breakdown immediately upon being overtaken and delays for 30 minutes before continuing at 90 km/h, determine which car arrives at town B first and by how many minutes. [3 Marks]

13. The vector positions of three towns A , B , and C are given relative to an airfield O .

The vectors $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.

Point C lies on AB such that $AC:CB = 2:3$.

Point M is the midpoint of OA .

(a) Express the vectors $\overrightarrow{AB}$ and $\overrightarrow{OC}$ in terms of $\mathbf{a}$ and $\mathbf{b}$. [3 Marks]

(b) Express the vector $\overrightarrow{MC}$ in terms of $\mathbf{a}$ and $\mathbf{b}$. [2 Marks]

(c) Line MC is produced to point N such that $\overrightarrow{MN} = k\overrightarrow{MC}$, and $\overrightarrow{BN} = h\mathbf{a}$, where k and h are scalars. Show that $\overrightarrow{ON}$ can be expressed in **two different ways** and find the values of k and h . [4 Marks]

(d) Deduce the ratio in which point C divides MN . [1 Mark]

14. The frequency distribution table below shows the distribution of marks scored by Grade 10 students in an end-of-term mathematics test.

Marks Class	Frequency f
30–39	4
40–49	8
50–59	14
60–69	12
70–79	8
80–89	4

(a) State the **modal class** and calculate the **estimated mean mark** for the distribution. [4 Marks]

(b) Calculate the **median mark** using the interpolation method.

[3 Marks]

(c) If two students are selected at random from the class, calculate the probability that **both scored 60 marks or above**.

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

PHYSICAL EDUCATION

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

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LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

1. a) State **two** important facilities required for playing a standard football match. (2 marks)

i. _____

ii. _____

b) Name the skill in football in which a player sends the ball through the air over a distance to a teammate. (1 mark)

2. Study the sequence below representing the execution of a football skill.



a) Identify the football skill represented. _____ (1 mark)

b) State **two** important factors a learner should observe when performing this skill. (2 marks)

i. _____

ii. _____

3. a) Name **two** passing skills learnt in Grade 10 netball. (2 marks)

i. _____

ii. _____

b) State **one** reason why accuracy is important when executing a pass in netball. (1 mark)

4. Study the diagram below.



a) Identify the volleyball skill illustrated. _____ (1 mark)

b) State **two** points to observe when performing this skill correctly. (2 marks)

i. _____

ii. _____

5. a) What is meant by **sidestep** in handball? (1 mark)

b) State **two** situations in which sidestep movement can be useful during a handball game.

(2 marks)

i. _____

ii. _____

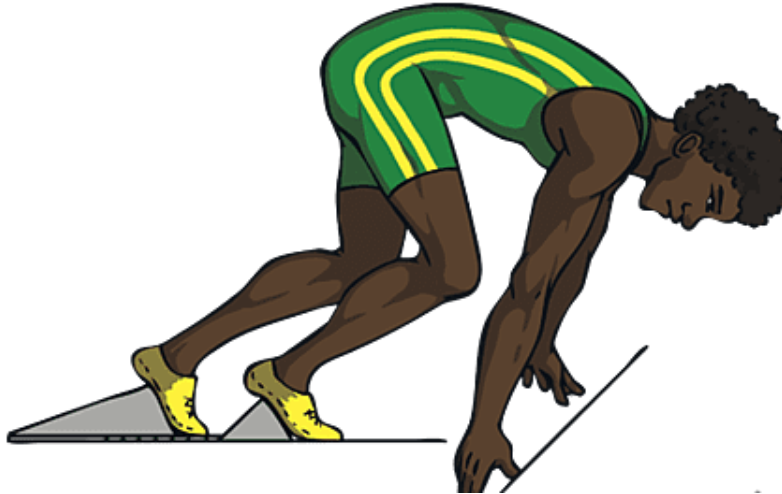
6. a) Name the basketball shooting technique in which the player shoots the ball while remaining stationary, usually using both hands in a controlled motion. (1 mark)

b) State **two** factors that can improve accuracy when performing this shot. (2 marks)

i. _____

ii. _____

7. The following diagram represents the starting position of an athlete.



a) Identify the type of start represented. _____ (1 mark)

b) State **two** reasons why a proper starting technique is important in sprinting. (2 marks)

i. _____

ii. _____

8. Name the **four main phases** of the long jump. (3 marks)

i. _____

ii. _____

iii. _____

iv. _____

9. a) State **one** safety precaution that should be observed before a javelin is thrown. (1 mark)

b) Give **two** characteristics of an effective javelin throwing technique. (2 marks)

i. _____

ii. _____

10. a) Where should the shot be placed before it is put? (1 mark)

b) State **two** safety measures that should be followed during a shot-put activity. (2 marks)

i. _____

ii. _____

SECTION B: 50 MARKS

Answer ALL questions in this section.

11. During a school football tournament, a Grade 10 learner is required to demonstrate effective attacking and defensive skills.

a) Explain **three stages** involved in performing an effective lofted pass in football. **(3 marks)**

i. _____

ii. _____

iii. _____

b) Describe **three techniques** that a player can use when attempting to dodge an opponent.

(3 marks)

i. _____

ii. _____

iii. _____

c) Explain **two important responsibilities of a goalkeeper** during a football match. **(2 marks)**

i. _____

ii. _____

d) State **two safety precautions** that players should observe during football training or competition.

(2 marks)

i. _____

ii. _____

12. A school coach is training learners to improve their passing and attacking skills in netball and volleyball.

(a) Explain the following components of a correct **flip pass in netball**: (4 marks)

i. Stance _____

ii. Grip _____

iii. Release _____

iv. Follow-through _____

(b)

i. Identify the skill commonly used to set up an attacking play in volleyball. (1 mark)

ii. Explain **three technical points** to observe when performing the skill identified in (b)(i).

(3 marks)

i. _____

ii. _____

iii. _____

iii. State **two ways** in which good sportsmanship can be demonstrated during a volleyball match.

(2 marks)

i. _____

ii. _____

13. (a) Handball

A handball player is attempting to move past a defender.

i. Describe the correct execution of a **sidestep** in handball. **(3 marks)**

i. _____

ii. _____

iii. _____

ii. Explain how a goalkeeper can effectively defend the goal using correct positioning and movement. **(2 marks)**

i. _____

ii. _____

(b)

A learner is practising the set shot.

i. Describe **three** technical points that should be observed when performing a basketball set shot. **(3 marks)**

i. _____

ii. _____

iii. _____

ii. Give **two reasons** why regular basketball practice can contribute to physical fitness and healthy living. **(2 marks)**

i. _____

ii. _____

14. A Grade 10 athlete is preparing for a 100-metre sprint.

i. Describe the **three commands** commonly used to organise a sprint start. (3 marks)

i. _____

ii. _____

iii. _____

ii. Explain **two** technical aspects of effective sprinting during the acceleration phase. (2 marks)

i. _____

ii. _____

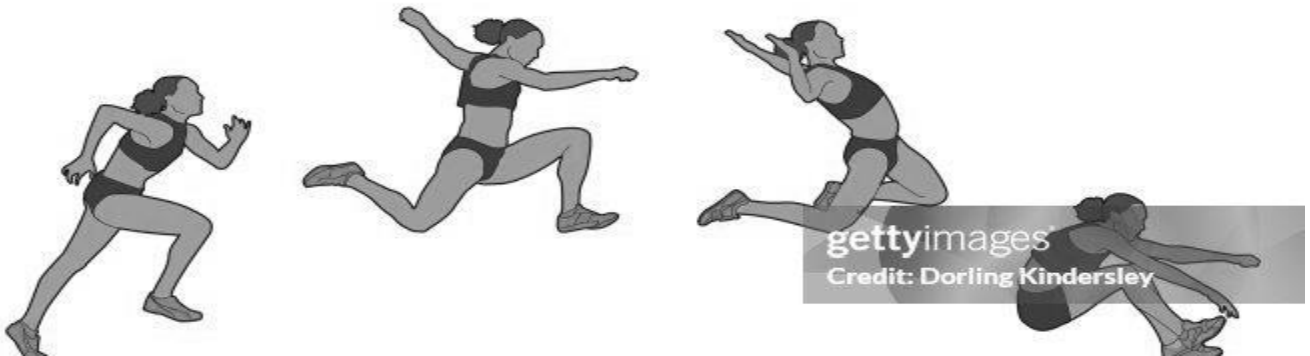
(b) Study the sequence below.

A

B

C

D



i. Identify the four phases labelled A, B, C and D.

(2 marks)

A: _____

B: _____

C: _____

D: _____

ii. Explain **one important technique** that should be observed during the take-off phase. (1 mark)

iii. State **two safety measures** that should be observed when conducting long-jump activities.

(2 marks)

i. _____

ii. _____

15. (a) i. Explain two differences **between javelin and shot put in terms of the implement and method of propulsion.** (2 marks)

<i>javelin</i>	<i>shot put</i>

ii. State **two safety precautions** that must be observed when conducting throwing events. (2 mks)

i. _____

ii. _____

(b) i. Name two optional sports **from the list above.**

(2 marks)

i. _____

ii. _____

ii. For **one** of the sports named in (b)(i), describe **two basic skills** used in the sport. (2 marks)

i. _____

ii. _____

(c) State two ways **in which regular participation in Physical Education can contribute to a healthy lifestyle.**

(2 marks)

i. _____

ii. _____

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

COMPUTER STUDIES

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

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SCORE RANG E	30 MAR KS	50 MAR KS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POIN TS	7 POIN TS	6 POIN TS	5 POIN TS	4 POIN TS	3 POIN TS	2 POIN TS	1 POI NT
LEARN ER'S TOTA L SCOR E											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. a) Define the term **computer system**. (1 mark)

b) State **two functions of the Central Processing Unit (CPU)**. (2 marks)

- i. _____
- ii. _____

c) Name the CPU component responsible for performing arithmetic and logical operations. (1 mark)

d) State one function of the Control Unit. (1 mark)

2. Study the simplified diagram below and answer the questions that follow.



a) Identify component **K**. (1 mark)

b) Identify component **L**. (1 mark)

c) Identify component **M**. (1 mark)

d) Identify component **N**. (1 mark)

e) State one function of component C. (1 mark)

3. (a) Distinguish between **data** and **information**. (2 marks)

b) Convert the binary number **101101₂** into decimal. Show your working. (2 marks)

c) State one reason why computers use the binary number system. (1 mark)

4. a) What is **software**? (1 mark)

b) Give **two examples of system software**. (2 marks)

- i.

- ii.

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

- i.

- ii.

5. a) Define a **computer network**.

(1 mark)

b) State two advantages of connecting computers in a network.

(2 marks)

- i.

- ii.

-

c) Distinguish between a **LAN** and a **WAN**.

(2 marks)

6. a) What is meant by **computer security**?

(1 mark)

b) State two ways of protecting a computer from malware.

(2 marks)

- i.

-
- ii.

-

c) Give two examples of responsible behaviour when using computer systems and the Internet.

(2 marks)

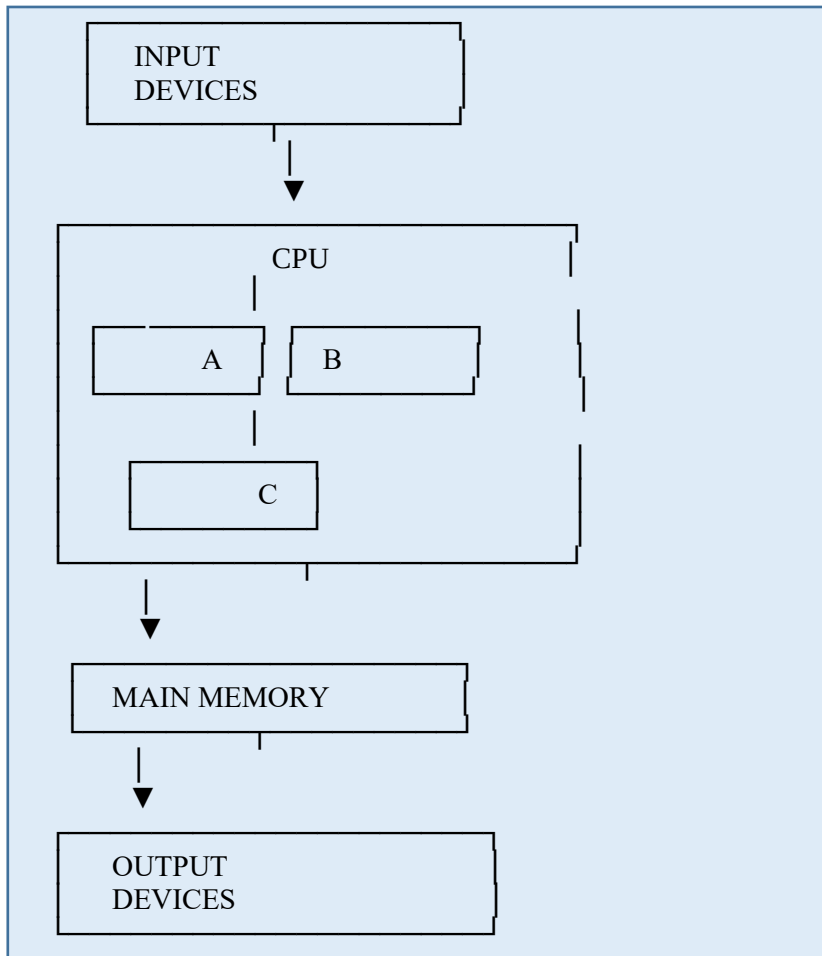
- i.

- ii.

SECTION B: 50 MARKS

Answer ALL questions in this section.

7. Study the block diagram below and answer the questions that follow.



a) Identify the CPU components labelled:

- i) A _____ (1 mark)
- ii) B _____ (1 mark)
- iii) _____ C (1 mark)

b) Explain the function of each of the three CPU components identified in (a). **(3 marks)**

c) Explain the role of input devices in a computer system.

(1 mark)

d) Explain the role of output devices.

(1 mark)

e) Distinguish between **primary memory** and **secondary storage**.

(2 marks)

8. A school laboratory has computers running an operating system. Students use the computers to create documents, save files and organise their work.

a) Define an **operating system**.

(1 mark)

b) State four functions of an operating system.

(4 marks)

i.

ii.

iii.

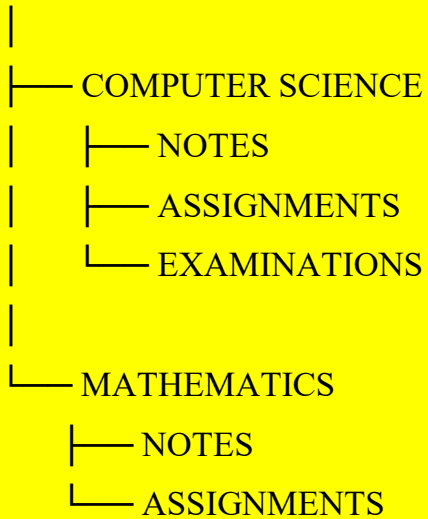
iv.

c) Explain the difference between a **file** and a **folder**.

(2 marks)

d) A student wants to organise examination documents using the following structure:

GRADE 10



Identify:

i) The **parent folder** of COMPUTER SCIENCE.

(1 mark)

ii) One **subfolder** under COMPUTER SCIENCE.

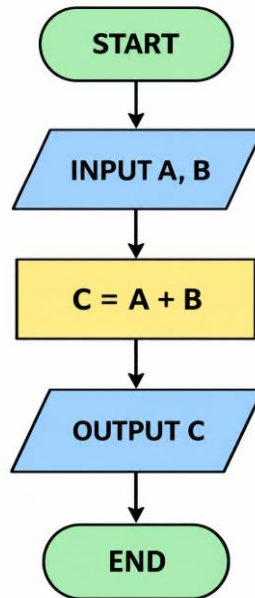
(1 mark)

c) State one advantage of organising files into folders.

(1 mark)

9. A learner is required to design a program that accepts two numbers, adds them and displays the result.

Study the flowchart below.



- a) Identify the flowchart symbol used for **START/END**. _____ (1 mark)
- b) Identify the symbol used for **INPUT A,B**. _____ (1 mark)
- c) Identify the symbol used for **C = A+B**. _____ (1 mark)
- d) Identify the symbol used for **OUTPUT C**. _____ (1 mark)
- e) Write an algorithm, in numbered steps, for the process represented by the flowchart. (4 marks)

- f) If $A = 15$ and $B = 27$, determine the value displayed as C . (2 marks)

10. a) Define the term **programming language**. (1 mark)

- b) Differentiate between a **high-level programming language** and a **low-level programming language**. (2 marks)

- c) State three characteristics of a good computer program. (3 marks)

- i. _____
ii. _____
iii. _____

- d) Study the pseudocode below. BEGIN

```
INPUT age
IF age >= 18 THEN
    OUTPUT "Adult"
ELSE
    OUTPUT "Minor"
ENDIF
END
```

- i) Identify the **input variable** used in the pseudocode. (1 mark)

- ii) State the condition being tested. (1 mark)

- iii) What output will be produced if the value entered is **20**? (1 mark)

- iv) What output will be produced if the value entered is **15**? (1 mark)

11. A secondary school intends to connect computers in its computer laboratory and provide learners with controlled access to the Internet.

a) State three devices that may be used to establish a computer network. **(3 marks)**

- i. _____
- ii. _____
- iii. _____

b) Explain the purpose of each of the following:

i) **Network switch** **(1 mark)**

- _____
- _____
- _____

ii) **Router** **(1 mark)**

- _____
- _____
- _____

c) State two benefits of Internet access in a school. **(2 marks)**

- i. _____
- ii. _____

d) A learner receives an email containing a suspicious attachment from an unknown sender.

State three actions the learner should take to remain safe. **(3 marks)**

- i. _____
- ii. _____
- iii. _____

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

GENERAL SCIENCE

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

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POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (35 MARKS)

Answer ALL questions in this section.

1. a) Define the term General Science. (1 mark)

b) Name three major branches of science that contribute to General Science. (3 marks)

- i.

- ii.

- iii.

c) State one importance of General Science in everyday life. (1 mark)

2. A learner wanted to investigate the effect of temperature on the rate at which sugar dissolves in water.

The learner used three beakers containing equal volumes of water at different temperatures.

a) State the **independent variable** in the investigation. _____ (1 mark)

b) State the **dependent variable**. _____ (1 mark)

c) Give **two variables that should be kept constant** for the investigation to be fair. (2 marks)

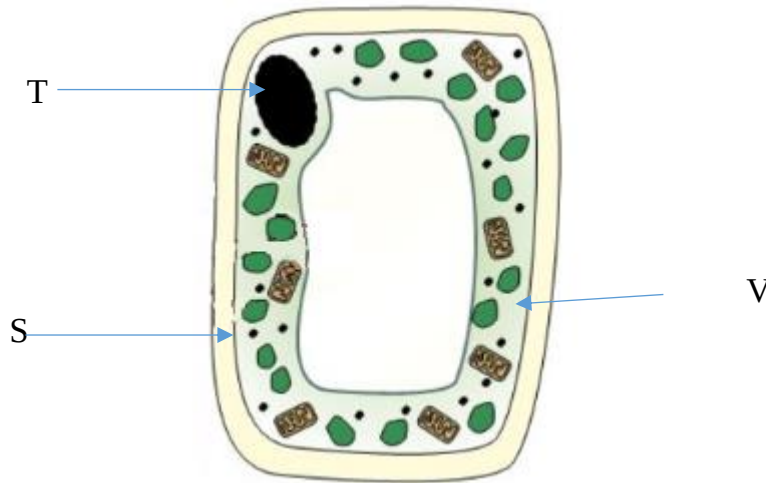
- i.

- ii.

-

d) State one **safety precaution** that should be observed when carrying out the investigation. (1 mark)

3. Study the simplified cell diagram below.



a) Identify structures **S, T and V**. (3 marks)

S: _____

T: _____

V: _____

b) State **one function of structure T**. (1 mark)

c) Is this a plant cell or an animal cell? Give reason for your answer. (1 mark)

4. a) What is meant by balanced diet? (1 mark)

b) Name the nutrient mainly responsible for:

i) growth and repair of body tissues; _____ (1 mark)

ii) providing energy for body activities. _____ (1 mark)

c) State **two differences between aerobic and anaerobic respiration**. (2 mrks)

	Aerobic respiration	Anaerobic respiration
i.		
ii.		

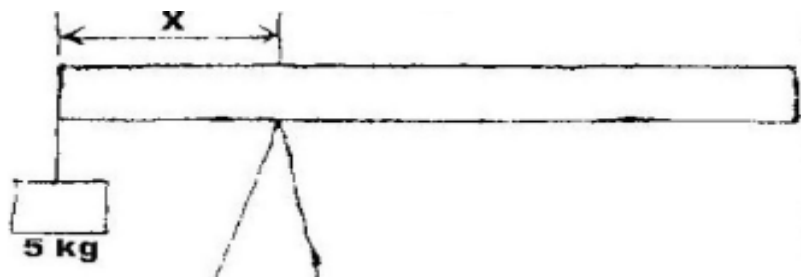
5. Three solutions were tested using universal indicator.

Solution	Colour obtained
P	Red
Q	Green
R	Purple

- a) Which solution is **neutral**? _____ (1 mark)
- b) Which solution is **strongly alkaline**? _____ (1 mark)
- c) State the approximate pH range expected for a neutral solution. _____ (1 mark)
- d) Give **two common examples of acids found in everyday life**. (2 marks)

- i. _____
- ii. _____
- _____

6. The diagram below shows a uniform bar of lengths 6m.



- a) If the weight of the bar is 15N, determine x. (3 marks)

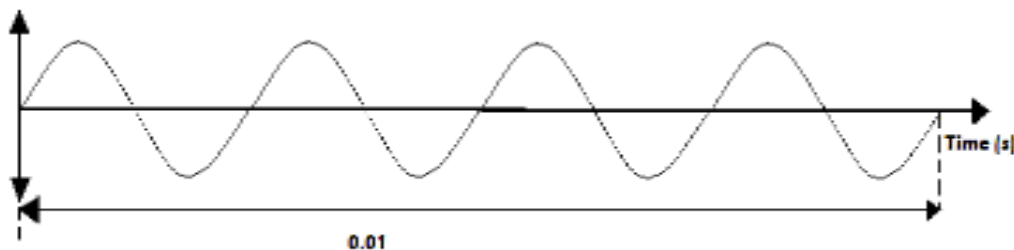
- b) State **two factors that determine the turning effect of a force**. (2 marks)

- i. _____
- _____
- ii. _____
- _____

SECTION B: 50 MARKS

Answer ALL questions in this section.

7. The diagram below shows a displacement-time graph for a certain wave.



a)

i. How many oscillations are shown above?

ii. Calculate the frequency of the wave

iii. Calculate the periodic time of the wave

b) Distinguish between **transverse waves and longitudinal waves**. (2 marks)

c) Give **two examples of waves used in everyday life or technology**. (2 marks)

- i.

- ii.

8. A healthy green plant was placed in water containing a coloured dye. After several hours, the coloured dye could be observed in the veins of the leaves.

a) Name the plant tissue responsible for transporting water and mineral salts from the roots to the leaves. (1 mark)

b) Explain how water moves from the soil into the roots. (2 marks)

c) State **two** factors that can affect the rate of transpiration. (2 marks)

i. _____

ii. _____

d) Explain the importance of transpiration to a plant. (2 marks)

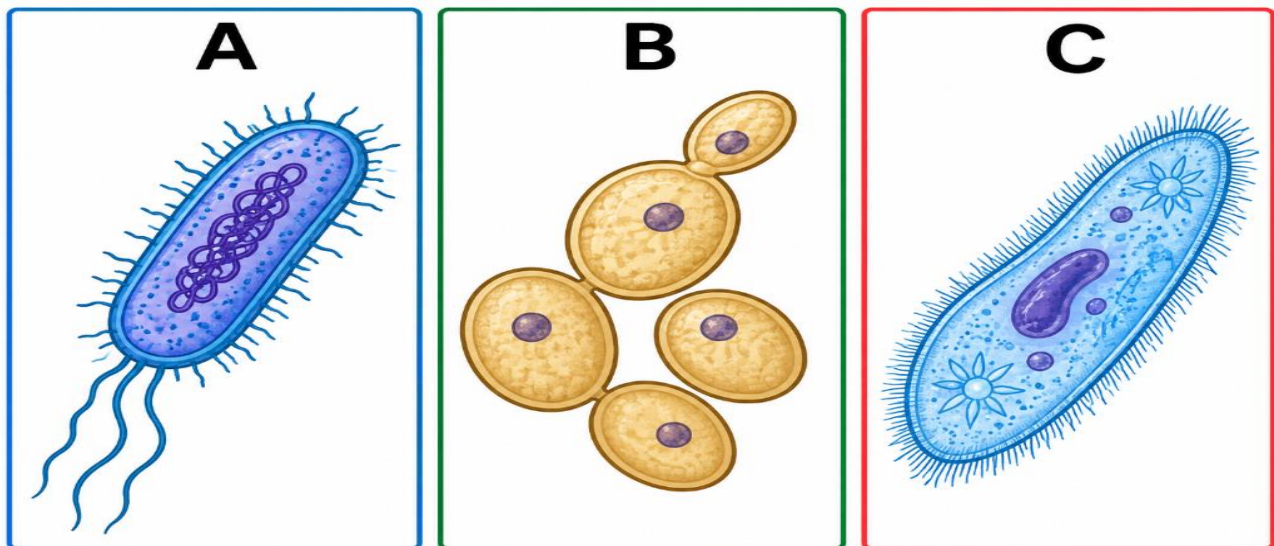
i. _____

ii. _____

e) Name the plant hormone mainly associated with **cell elongation** and **growth towards light**.

(1 mark)

9. The diagram below represents three microorganisms.



C: _____

ii. _____

v. Explain why:-

I. Ionic radius of Q is larger than that of M

II. Atomic radius of Q is greater than that of S

vi. Which of the element in the table does not have the ability to form an ionic or covalent bond?

Explain

vii. Give the formula of the compound formed between R and Z

11. A learner investigated the effect of temperature on the rate of reaction between dilute hydrochloric acid and calcium carbonate.

The learner obtained the following results:

Temperature (°C)	Time taken to collect a fixed volume of gas (s)
20	80
30	60
40	45
50	30

a) What does the term **rate of reaction** mean?

(2 marks)

b) Describe the relationship between temperature and the rate of this reaction. (2 marks)

c) Explain why increasing temperature generally increases the rate of a chemical reaction. (2 mks)

i. _____

ii. _____

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

i. _____

ii. _____

12. A motorbike starts from rest and accelerates uniformly at 4 m/s^2 for 6 seconds.

a) What is meant by **acceleration?** (1 mark)

b) State the initial velocity of the motorbike. (1 mark)

c) Calculate its final velocity after 6 seconds: (2 marks)

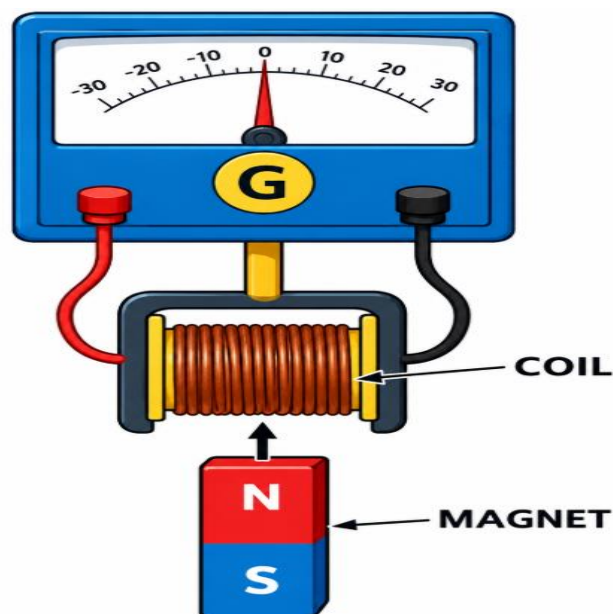
d) Calculate the distance travelled by the motorbike using: (3 marks)

e) State **two examples of situations in everyday life where acceleration occurs.** (2 marks)

i. _____

ii. _____

13. Study the simplified arrangement below.



a) Name the phenomenon in which an electric current is produced when there is relative motion between a magnet and a conductor. (1 mark)

b) State **two ways of increasing the induced current** in the coil. (2 marks)

- i. _____
- ii. _____

c) State the role of the galvanometer in the experiment. (1 mark)

d) Give **two practical applications of electromagnetic induction**. (2 marks)

- i. _____
- ii. _____
- _____

e) State **two properties of magnetic field lines**. (2 marks)

- i. _____
- ii. _____

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

HOME-SCIENCE

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

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LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. a) Define the term Home Science. (1 mark)

b) State **two ways** in which the study of Foods and Nutrition can contribute to an individual's wellbeing. (2 marks)

- i.

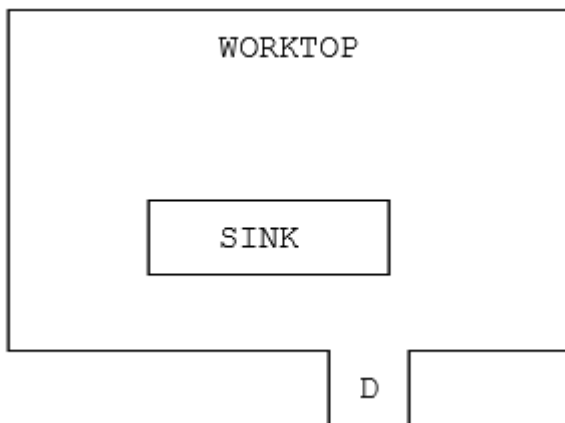
- ii.

c) Give **two careers** related to Foods and Nutrition. (2 marks)

- i.

- ii.

2. Study the simplified kitchen layout below.



a) Identify the kitchen layout represented above. (1 mark)

b) State **two advantages** of a well-planned kitchen layout. (2 marks)

- i.

- ii.

c) Give **two factors** that should be considered when planning a kitchen layout. (2 marks)

- i.

- ii.

3. A learner prepared lunch without washing their hands. The learner also used the same chopping board for raw meat and vegetables without cleaning it between uses.

a) Identify **two unsafe practices** in the situation. (2 marks)

- i. _____
- ii. _____

b) Explain **one danger** of using the same unclean chopping board for raw meat and vegetables. (1 mark)

- i. _____
- ii. _____

c) State **two personal hygiene practices** that should be observed when preparing food. (2 marks)

- i. _____
- ii. _____

4. a) Name three nutrients **found in foods**. (3 marks)

- i. _____
- ii. _____
- iii. _____

b) State **one function** of proteins in the body. (1 mark)

c) Explain why locally available foods should be considered when planning meals for a family. (1 mark)

5. a) State two hygiene practices **that are particularly important during puberty**. (2 marks)

- i. _____
- ii. _____

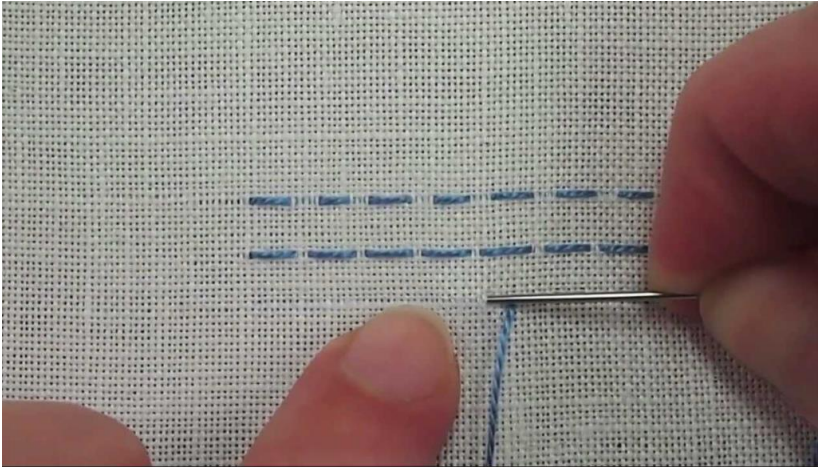
b) Name **two common accidents** that may occur in the home. (2 marks)

- i. _____
- ii. _____

c) Give **one reason** why a first-aid kit should be readily available in a home. (1 mark)

- i. _____
- ii. _____
- _____

6. Study the diagram below.



a) Identify the stitch represented. _____ (1 mark)

b) State **two uses** of the stitch identified in (a). (2 marks)

- i. _____
- ii. _____
- _____

c) Name **two sewing tools** used in basic clothing construction. (2 marks)

- i. _____
- ii. _____

SECTION B: 50 MARKS

Answer **ALL** questions in this section.

7. A family is preparing a meal consisting of vegetables, beef and a cereal-based accompaniment.

a) Distinguish between **moist-heat cooking** and **dry-heat cooking**. (2 marks)

b) Name **four methods of cooking** that a learner would study under Grade 10 Home Science.

(4 marks)

- i. _____
- ii. _____
- iii. _____
- iv. _____

c) Explain **two factors** that determine the choice of a cooking method. (2 marks)

- i. _____
- ii. _____

d) A learner decides to deep-fry food. State **two safety precautions** that should be observed.

(2 marks)

- i. _____
- ii. _____

8. A family in a rural Kenyan community mainly consumes ugali, vegetables and tea. The parents have noticed that their children often appear tired and their meals lack variety.

a) Explain what is meant by a **balanced diet**. (2 marks)

b) State **two functions of carbohydrates** in the body. (2 marks)

- i. _____
- ii. _____

c) Give **two examples of protein-rich foods** that could be incorporated into the family's meals.

(2 marks)

- i. _____
- ii. _____

d) State **two factors** that should be considered when planning meals for this family. (2 marks)

- i. _____
- ii. _____

e) Explain how meal planning can help a family make better use of its available resources.

(2 marks)

- i. _____
- ii. _____

9. During the evening, a learner accidentally touches a hot cooking pot and suffers a minor burn. At the same time, another family member slips on a wet floor.

a) Identify the **two accidents** described in the situation. (2 marks)

- i. _____
- ii. _____

b) State **two possible causes** of accidents in the home. (2 marks)

- i. _____
- ii. _____

c) Outline the immediate first-aid measures that should be taken for a **minor burn**. (3 marks)

- i. _____
- ii. _____
- iii. _____

d) State **three measures** that can be taken to prevent accidents caused by slippery floors. (3 marks)

- i. _____
- ii. _____
- iii. _____

10. A family is constructing a new house and wants to ensure that it provides a healthy and comfortable living environment.

a) State **three factors** that should be considered when selecting a site for a family house. (3 marks)

- i. _____
- ii. _____
- iii. _____

b) Give **two reasons** why adequate ventilation is important in a house. (2 marks)

- i. _____
- ii. _____

c) State **two principles** that should guide efficient cleaning of a house. (2 marks)

- i. _____
- ii. _____

d) A white cotton shirt has a food stain.

i. State **one appropriate preliminary treatment** for the stain. (1 mark)

ii. Give **two precautions** that should be observed when laundering coloured garments. (2 marks)

- i. _____
- ii. _____

11. Study the illustrations below.



a) Identify **the tool** that could be represented above. (1 mark)

b) State **two uses** of the tool identified in (a). (2 marks)

i. _____

ii. _____

c) Name **two natural textile fibres** and state the source of each. (4 marks)

i. _____

ii. _____

d) Distinguish between a **stitch** and a **seam**. (2 marks)

e) State **one reason** for controlling fullness during garment construction. (1 mark)

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

AVIATION TECHNOLOGY

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

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POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. State **two historical developments** that contributed to the advancement of aviation technology. (2 marks)

2. Distinguish between **lighter-than-air** and **heavier-than-air** aircraft. (2 marks)

3. Give **two examples of lighter-than-air aircraft**. (2 marks)

- i. _____
- ii. _____

4. Identify **two major functions of aircraft** in society. (2 marks)

- i. _____
- ii. _____

5. State **two general safety rules** that should be observed when working in an aviation workplace. (2 marks)

- i. _____
- ii. _____

6. A learner notices fuel spilled on the floor of an aircraft maintenance area. State **two immediate actions** that should be taken. (2 marks)

- i. _____
- ii. _____

7. State **two items** that should be found in an aviation workplace first-aid kit. (2 marks)

- i. _____
- _____
- ii. _____
- _____

8. Differentiate between an **airside area** and a **landside area** of an airport. (2 marks)

Airside area	Landside area

9. State **two hazards** that may be encountered in an airport airside area. (2 marks)

- i. _____
- ii. _____

9. Give **two functions** of the following section of an aircraft. (2 marks)



- i. _____
- ii. _____
- _____

11. State **two functions** of aircraft wings. (2 marks)

- i. _____
- ii. _____

12. Name **two aircraft tools** used for measuring or marking. (2 marks)

- i. _____
- ii. _____

13. State **two properties of materials** that make them suitable for aircraft construction. (2 marks)

i. _____

ii. _____

14. Name the two main types of aircraft based on their method of generating lift and propulsion:
(2 marks)

i. _____

ii. _____

15. State **two factors that influence aircraft flight**. (2 marks)

i. _____

ii. _____

SECTION B: 50 MARKS

Answer ALL questions in this section.

16. During an Aviation Technology lesson, learners were asked to investigate how aviation developed from early attempts at human flight to modern aircraft.

(a) Name the two brothers associated with the successful development of the early powered aircraft.
(2 marks)

i. _____

ii. _____

(b) State **two contributions** made by early aviation pioneers to the development of aviation.
(2 marks)

i. _____

ii. _____

(c) Explain **three differences** between lighter-than-air and heavier-than-air aircraft. (3 marks)

lighter-than-air	heavier-than-air

(d) State **three uses of aircraft** in modern society. (3 marks)

i. _____

ii. _____

iii. _____

17. A Grade 10 learner visits an aircraft maintenance workshop.



Q



R



S

(a) Identify **three hazards** in the situation described. (3 marks)

i. Q: _____.

ii. R: _____.

iii. S: _____.

(b) For each hazard identified in (a), suggest **one appropriate control measure**. (3 marks)

Hazard	Control measure
Q	
R	
S	

(c) Explain **two reasons why personal protective equipment is important** in an aviation workplace. (2 marks)

i. _____

ii. _____

(d) State **two actions a learner should take when an accident occurs in an aviation workplace**. (2 marks)

i. _____

ii. _____

18. A school Aviation Technology club is constructing a simple model of a fixed-wing aircraft. The teacher asks learners to identify the major components before beginning construction.

(a) Name the following major aircraft components:

(i) The main body of an aircraft. _____ (1 mark)

(ii) The surfaces that generate most of the lift. _____ (1 mark)

(iii) The rear assembly that provides stability and control. _____ (1 mark)

(iv) The structure used to support an aircraft while on the ground. _____ (1 mark)

(b) Explain the function of the following:

(i) Landing gear (2 marks)

(ii) Wings (2 marks)

(iii) Empennage (2 marks)

19. During a practical lesson, learners are provided with aluminium sheet, a ruler, a try square, a scribe, a hacksaw and a file.

(a) Classify the following tools as either **measuring/marketing tools** or **cutting/finishing tools**:
(4 marks)

(i) Ruler: _____

(ii) Scribe: _____

(iii) Hacksaw: _____

(iv) File: _____

(b) State **two reasons why aluminium and its alloys are commonly useful in aircraft construction**. (2 marks)

i. _____

ii. _____

(c) State **two safety precautions** when using cutting tools in an aircraft workshop. (2 marks)

- i. _____
- ii. _____

(d) A learner is required to prepare an isometric drawing of a simple aircraft component. State **two characteristics of a good technical drawing**. (2 marks)

- i. _____
- ii. _____

20. A passenger aircraft is preparing to depart from a Kenyan airport. The weather officer reports strong winds and poor visibility. Meanwhile, the pilot communicates with air traffic control before receiving clearance to take off.

(a) State **two elements of weather** that are important to aviation. (2 marks)

- i. _____
- ii. _____

(b) Explain **two ways in which weather can affect aircraft operations**. (4 marks)

- i. _____

- ii. _____

(c) State **two purposes of aviation communication** between pilots and air traffic controllers. (2 marks)

- i. _____
- ii. _____

(d) Name **two business services commonly associated with airport operations**. (2 marks)

- i. _____
- ii. _____

KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

BUILDING AND CONSTRUCTION

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

1. Write your name in the spaces provided above.
2. Write the name of your school and your stream in the spaces provided.
3. Write your admission number and the date of the assessment in the spaces provided.
4. This paper consists of two sections: A and B.
5. Answer all questions in section A and section B.
6. Answer the questions in English.
7. All answers *MUST* be written in the spaces provided in the paper.
8. Do *NOT* remove any page from this question paper.

FOR OFFICIAL USE ONLY (EXAMINER'S USE)

SECTION	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. A group of Grade 10 learners at Cardinal Otunga Senior visited a construction site in their locality. They observed residential houses, shops, offices and a school building under construction.

a) Define the term **building construction**. (2 marks)

.....

b) State **two reasons why buildings are important in society**. (2 marks)

i.....

ii.....

c) Name **one type of building** used for each of the following purposes: (3 marks)

i. Residential

ii. Commercial

iii. Social

2. Buildings have developed from simple shelters such as caves and temporary huts to complex modern structures.

a) State **two early forms of shelter** used by human beings. (2 marks)

i.....

ii.....

b) Name **three basic components of a building**. (3 marks)

i.

ii.

iii.

3. A contractor intends to construct a classroom block on a piece of land that contains bushes, stones, loose soil and an old structure.

a) State **two activities carried out during site clearance**. (2 marks)

i.

ii.

b) Give **two reasons for setting out a building before excavation**. (2 marks)

i.....

ii.....

c) Name **one tool used in setting out a building.** (1 mark)

.....

4. A building technician is preparing drawings for a small residential building.

a) What is meant by **scale in technical drawing?** (2 marks)

.....

.....

b) State **two types of lines commonly used in building drawings.** (2 marks)



S



T

S.

T.

c) State **one advantage of using a scale when preparing a building drawing.** (1 mark)

.....

5. A learner was given samples of cement, sand, ballast, timber and bricks for identification.

a) State **one use of cement in building construction.** (1 mark)

.....

b) State **one use of timber in building construction.** (1 mark)

.....

c) Give **two properties of good building sand.** (2 marks)

i.

ii.

d) State **one factor considered when selecting building materials.** (1 mark)

.....

6. During the construction of a foundation, a concrete mixture is prepared using cement, sand, coarse aggregate and water.

a) Name the **four main ingredients of concrete.** (4 marks)

i.

ii.

iii.

iv.

b) State **one purpose of water in concrete mixing.**

(1 mark)

7. A contractor is preparing trenches for the foundation of a single-storey building.

a) State **two factors that determine the depth of a foundation.**

(2 marks)

i.....

ii.....

b) State **one function of a foundation.**

(1 mark)

c) Name **one material commonly used in foundation construction.**

(1 mark)

8. During excavation, the sides of a deep trench become unstable and begin to collapse.

a) What is **timbering**?

(2 marks)

b) State **two reasons for timbering excavation sides.**

(2 marks)

i.....

ii.....

c) State **one danger associated with unsupported excavations.** (1 mark)

9. After the foundation concrete has gained sufficient strength, the mason begins constructing the foundation wall.

a) State **two functions of foundation walling.** (2 marks)

i.....

ii.....

b) Name **one material that can be used to construct foundation walls.** (1 mark)

c) State **two functions of a ground floor.** (2 marks)

i.....

ii.

10. A plumber is installing a water supply system in a newly constructed house.

a) Name **two tools below used in plumbing work**. (2 marks)



M.

N.

b) State **two safety precautions** that should be observed when carrying out plumbing work. (2 marks)

i.

ii.

c) Name **one material** used for making water pipes. (1 mark)

.....

SECTION B: 50 MARKS

Answer ALL questions in this section.

11. A community has acquired a piece of land on which a two-classroom block is to be constructed.

The site is covered with vegetation and contains several stones. The contractor first prepares the site before setting out the building.

a) Explain **four activities** that should be carried out during **site preparation** before construction begins. (4 marks)

i.

.....

ii.

.....

iii.

.....

iv.....

.....

b) Describe the procedure for setting out a simple rectangular building. (4 marks)

.....

.....

.....

.....

.....

.....

.....

.....

c) State two precautions to observe during setting out. (2 marks)

i.....

.....

ii.....

.....

12. A building technician has been asked to prepare a simple working drawing for a small house.

a) Differentiate between a plan and an elevation of a building. (4 marks)

Plan:

.....

.....

.....

Elevation:

.....

.....

.....

b) State three types of information that may be shown on a building plan. (3 marks)

i.

ii.

iii.

c) A wall measuring **6 metres** in actual length is represented by a line measuring **12 centimetres** on a drawing.

Determine the scale used. Show your working.

(3 marks)

.....

.....

.....

.....

13. A contractor is constructing the foundation of a proposed classroom block. The concrete used for the foundation must be properly proportioned, mixed, placed and compacted.

a) Explain four steps involved in preparing concrete for foundation work. (4 marks)

i.....

.....

ii.....

.....

iii.....

.....

iv.....

.....

b) Explain three reasons why concrete should be properly compacted after placing. (3 marks)

i.....

.....

ii.....

.....

iii.....

.....

c) State three factors that should be considered when determining the suitability of a foundation for a building.

(3 marks)

i.....

ii.....

iii.....

.....

14. During the construction of a residential house, the contractor excavates deep foundation trenches. The soil is loose and the sides of the trenches are likely to collapse.

a) Explain three reasons why timbering may be necessary in excavation work. (3 marks)

i.....

.....

ii.....

.....

iii.....

.....

b) Describe three stages involved in constructing foundation walling after the foundation has been prepared. (3 marks)

i.....

.....

ii.....

.....

iii.....

.....

c) Explain four considerations when constructing a ground floor. (4 marks)

i.....

.....

ii.....

.....

iii.....

.....

iv.....

.....

15. A newly constructed house requires a water supply and waste-water disposal system. A plumber is instructed to install the system using appropriate tools, materials and pipe fittings.

a) Name four plumbing tools that may be required for the installation. (4 marks)

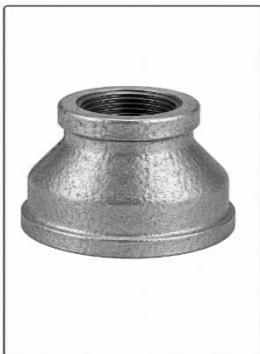
i.

ii.

iii.

iv.

b) Identify and explain the function of **the pipe fittings** used in plumbing. (3 marks)



Pipe fitting	Function
Q	
R	
S	

c) State **three factors** that should be considered when selecting pipes for a building water-supply system. (3 marks)

- i.....
.....
- ii.....
.....
- iii.....
.....

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

ELECTRICITY TECHNOLOGY

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

- Write your full name in the space provided above.
- Indicate your school and stream clearly.
- Fill in your admission number and the date.
- The paper is divided into **Section A and Section B**.
- Attempt **all questions** in both sections.
- Respond to all questions in **English**.
- Write all answers in the spaces provided in the question paper.
- Do not tear or remove any page from this paper.

FOR OFFICIAL USE ONLY (EXAMINER'S USE)

SECTION N	SECTION N A	SECTION N B	% SCO RE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANG E	30 MAR KS	50 MAR KS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POIN TS	7 POIN TS	6 POIN TS	5 POIN TS	4 POIN TS	3 POIN TS	2 POIN TS	1 POIN T
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. a) Define the term **electric current**. (1 mark)

b) State the SI unit of electric current. (1 mark)

c) Name the instrument used to measure electric current in a circuit. (1 mark)

2. a) What is an electrical conductor? (1 mark)

b) Give **two examples** of materials commonly used as electrical conductors. (2 marks)

- i.

- ii.

3. State **three safety precautions** that should be observed when working with electrical equipment. (3 marks)

- i.

- ii.

- iii.

4. A circuit has a potential difference of **12 V** and a current of **3 A**.

a) Write the formula used to calculate resistance. (1 mark)

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

5. Name the appropriate electrical tool used for each of the following tasks:

- a) Tightening a screw on an electrical terminal. _____ (1 mark)
- b) Removing insulation from an electrical conductor. _____ (1 mark)
- c) Cutting an electrical wire. _____ (1 mark)

6. Draw the standard circuit symbols for:

a) A cell. (1 mark)

b) A switch. (1 mark)

c) A lamp. (1 mark)

7. a) State **one characteristic** of a series circuit. (1 mark)

b) State **one characteristic** of a parallel circuit. (1 mark)

c) Give **one advantage** of connecting domestic electrical appliances in parallel. (1 mark)

8. a) Name the instrument used to measure potential difference. (1 mark)

b) State how this instrument is connected in an electrical circuit. (1 mark)

c) State the instrument used to measure resistance. (1 mark)

9. A 100 W electric lamp is operated for **5 hours**.

a) State the formula for calculating electrical energy in watt-hours. (1 mark)

b) Calculate the electrical energy consumed by the lamp in watt-hours. (1 mark)

c) Express your answer in kilowatt-hours (kWh). (1 mark)

10. State the function of each of the following:

a) Electrical cable. (1 mark)

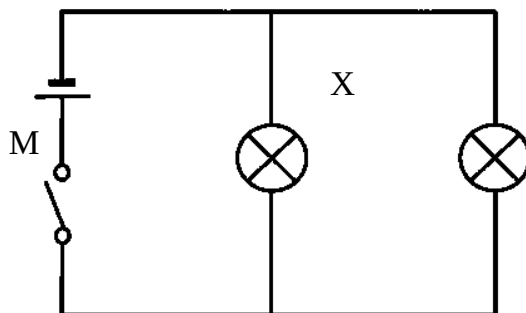
b) Switch. (1 mark)

c) Fuse. (1 mark)

SECTION B: 50 MARKS

Answer ALL questions in this section.

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



a) Identify component **M**. _____ (1 mark)

b) Identify component **X**. _____ (1 mark)

c) State the energy transformation that takes place in component X when the switch is closed.

(2 marks)

d) State the function of the switch in the circuit. (2 marks)

e) Explain what happens to the lamp when the switch is opened. (2 marks)

f) State **two conditions** necessary for current to flow in this circuit. (2 marks)

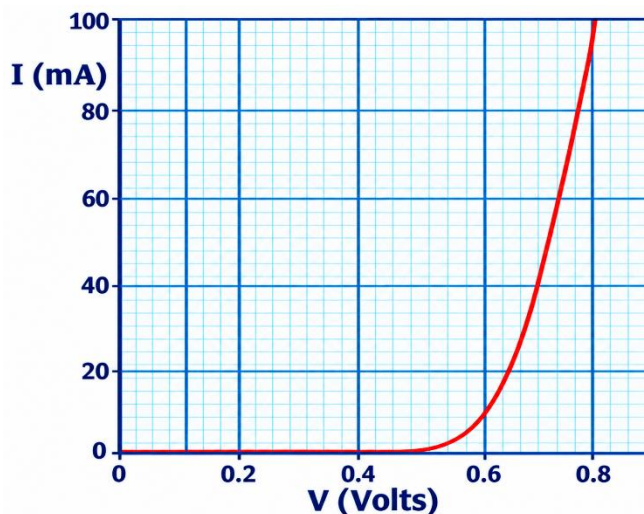
- i.

- ii.

12. A learner sets up a circuit to investigate the relationship between voltage and current through a resistor.

a. State Ohm's law (1 mark)

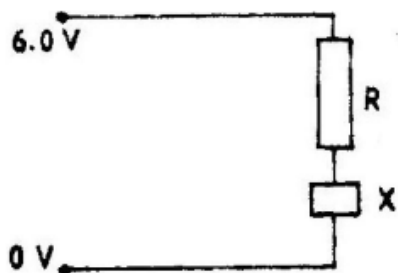
i. The graph in the figure below shows the current voltage characteristics of a device, X



State with a reason whether the device obeys Ohm's laws (2 marks)

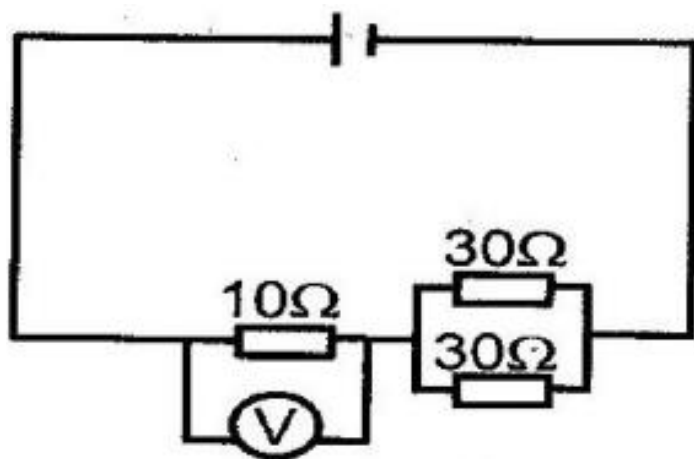
ii. Determine the resistance of the device X when the current through it is 60mA. (1 mark)

iii. When the device X is connected in the circuit below, the voltage across it is 0.70V.



Calculate the value of the resistance R. (mark)

b. The cell in the figure below has an emf of 2.1V and negligible internal resistance.



Determine the

i. Total resistance in the circuit (1 mark)

ii. Current in the circuit (1 mark)

iii. Reading on the voltmeter (1 mark)

c. State **two factors** that may affect the resistance of an electrical conductor. (2 marks)

- i. _____
- ii. _____
- _____

13. The diagram below represents an electrical hand tool.



a) Identify the tool shown. _____ (1 mark)

b) State **two uses** of the tool in electrical work. (2 marks)

- i. _____
- ii. _____

c) State **three precautions** to observe when using electrical hand tools. (3 marks)

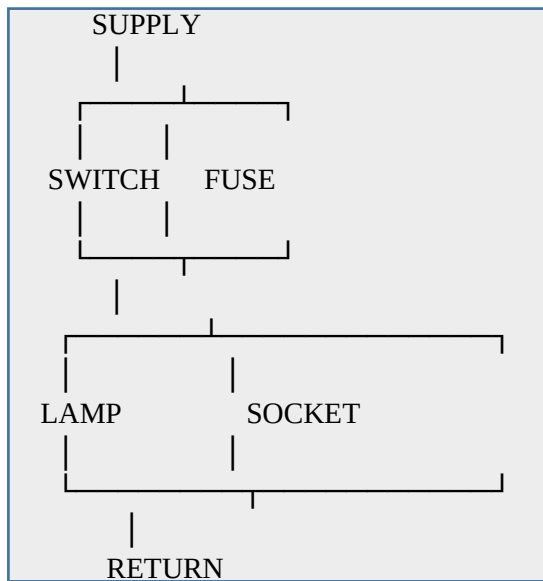
- i. _____
- ii. _____
- iii. _____

d) Explain why insulated handles are important when working with electrical conductors. (2 marks)

e) State **two factors** to consider when selecting an electrical hand tool for a particular task. (2 mks)

- i. _____
- ii. _____
- _____

14. Study the simplified arrangement of a domestic electrical installation below.



a) Identify the protective device shown in the diagram. _____ (1 mark)

b) State the main function of a fuse in a domestic electrical installation. (2 marks)

c) Explain why domestic appliances are connected in parallel rather than in series. (2 marks)

d) State **two electrical appliances** that may be connected to a domestic socket outlet. (2 marks)

i. _____

ii. _____

e) State **three safety precautions** when carrying out domestic electrical installation work. (3 mks)

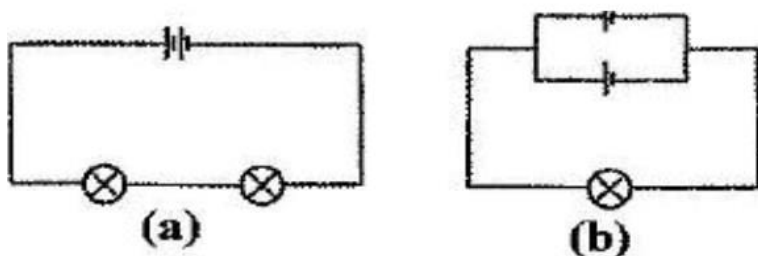
i. _____

ii. _____

iii. _____

15. A current of 0.5A flows in a circuit. Determine the quantity of charge that crosses a point in 4 minutes.

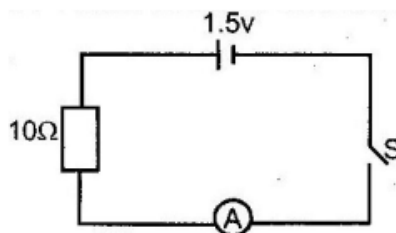
16. The figure below shows two circuits in which identical dry cells and identical bulbs are used. Use the information in the figure to answer questions (a) and (b)



- a. Explain why the bulb in figure (b) will be brighter than each of the bulbs in figure (a). (2 marks)

- b. Give the reason why the cells in figure (b) can be used for a longer period than the cells in figure (a)

17. Study the circuit diagram shown in the figure below. The ammeter has negligible resistance. When switch S is closed, the ammeter records a current of **0.13 A**. (3 marks)



- a) Determine the resistance of the resistor connected in the circuit.
- b) Show the steps used in arriving at your answer.

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

MARINE TECHNOLOGY

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

7. Write your details as required above
8. This paper consists of two sections: A and B.
9. Answer all questions in section A and section B.
10. Answer the questions in English.
11. All answers MUST be written in the spaces provided in the paper.
12. Do NOT remove any page from this question paper.

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SECTION	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. a) Define the following terms:

i. **Marine fisheries (1 mark)**

.....

.....

ii. **Freshwater fisheries (1 mark)**

.....

.....

iii. **Aquaculture (1 mark)**

.....

.....

b) State **three importance of fisheries to the Kenyan economy. (3 marks)**

- i.....
- ii.....
- iii.....

2. Study the simplified illustration below and answer the questions that follow.



X



Y

a) Identify the two aquatic environments represented in the diagram. **(2 marks)**

X.

Y.

b) State **two physical characteristics of marine environments.** **(2 marks)**

i.....

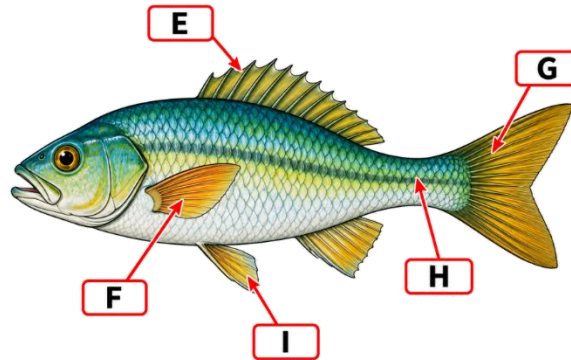
ii.....

c) Give **two examples of freshwater fishing grounds in Kenya.**

(2 marks)

- i.....
 ii.....

3. Study the fish diagram below.



a) Identify the fish structures labelled E, F, G, H and I. (5 marks)

- E
 F
 G
 H
 I

b) State **one function of the gills in a fish.** (1 mark)

.....

4. a) State **three factors that should be considered when selecting a site for fish farming.**
 (3 marks)

- i.....
 ii.....
 iii.....

b) Give **three advantages of aquaculture to a community.** (3 marks)

- i.....
 ii.....
 iii.....

5. a) Distinguish between **natural fish food** and **artificial fish feed**. (2 marks)

.....

.....

.....

b) State **two factors that determine the feeding rate of fish in an aquaculture system**. (2 marks)

i.....

ii.....

c) Explain **two effects of overfeeding fish in a pond**. (2 marks)

i.....

.....

ii.....

.....

SECTION B: 50 MARKS

Answer ALL questions in this section.

6. A fisheries officer visited a coastal fishing community and observed that some fish species were abundant around coral reefs while others were found in deeper waters.

a) Explain **four adaptations of fish that enable them to survive in aquatic environments**. (4 marks)

i.....

.....

ii.....

.....

iii.....

.....

iv.....

.....

b) Explain how **each of the following environmental factors can affect fish distribution**:

i. **Water temperature** (2 marks)

.....

.....

.....

ii. **Dissolved oxygen (2 marks)**

.....
.....
.....

b) State **two ways in which human activities can negatively affect aquatic ecosystems.**
(2 marks)

- i.
ii.

13. A farmer intends to establish a commercial fish farm and is considering using different production systems.

a) Name **three aquaculture production systems.** (3 marks)

- i.....
ii.....
iii.....

b) Describe **two advantages of using ponds for fish production.** (2 marks)

- i.....
.....
ii.....
.....

c) A farmer stocks **1,500 fingerlings** in a pond. At harvesting, **1,275 fish** are recovered.

Calculate the **survival rate** of the fish. (3 marks)

d) State **two management practices that can improve fish survival in an aquaculture system.**
(2 marks)

- i.....
ii.....
.....

14. A farmer notices that fish in a pond are growing at different rates. Some fish are very small while others are considerably larger.

a) State **three essential nutritional components required in fish feed.** (3 marks)

i.....

ii.....

iii.....

b) Explain **two reasons why fish require proteins in their diet.** (2 marks)

i.....

.....

ii.....

.....

c) Describe **three good practices for feeding fish in a pond.** (3 marks)

i.....

.....

ii.....

.....

iii.....

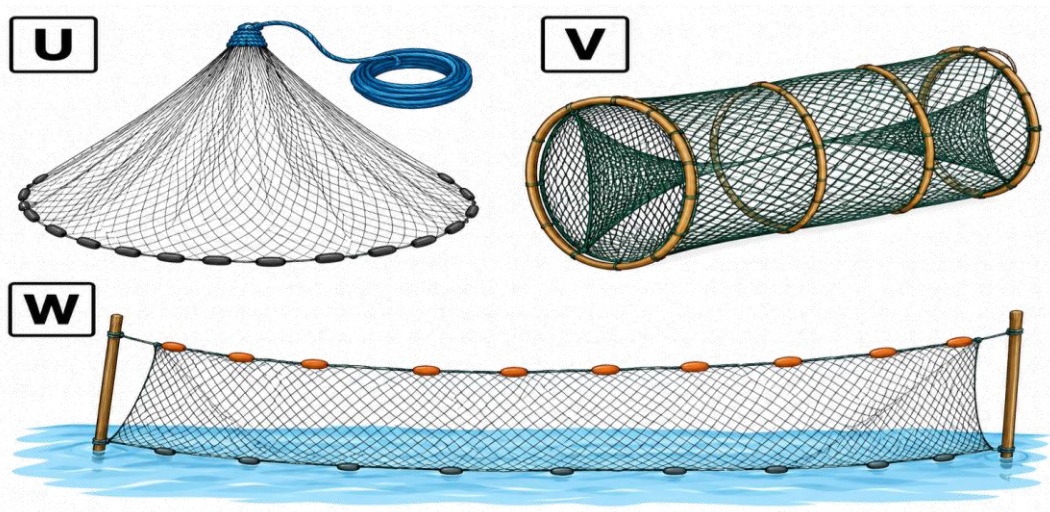
.....

d) State **two indicators that can be used to determine whether fish are feeding adequately.** (2 marks)

i.....

ii.....

15. Study the simplified fishing gear illustrations below.



a) Identify the fishing gears represented by U, V and W. (3 marks)

U.

V.

W.

b) State **one suitable fishing situation or environment** for each gear identified in (a). (3 marks)

U.....

V.....

W.....

c) Give **two factors that determine the choice of fishing gear or method**. (2 marks)

i.....

ii.....

d) State **two fishing practices that can contribute to overfishing**. (2 marks)

i.....

ii.....

16. A group of Grade 10 learners accompanied a fisheries officer on a fishing expedition. Before entering the water, the officer inspected the boat, safety equipment and weather conditions.

a) State **four safety precautions that should be observed before and during a fishing expedition**. (4 marks)

i.....

.....

ii.....

.....

iii.....

.....

iv.....

.....

b) Explain the importance of **two personal protective or survival equipment items used during fishing activities**. (2 marks)

i.....

.....

ii.....

.....

iii.....
.....

iv.....
.....

c) Explain **two measures that can be used to promote sustainable capture fisheries in Kenya.**
(2 marks)

i.....
.....

ii.....
.....

d) State **two career or entrepreneurial opportunities associated with marine and fisheries technology.** (2 marks)

i.....
.....

ii.....
.....

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

MEDIA TECHNOLOGY

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

- Write your details as required in the spaces above.
- This paper consists of two sections: A and B.
- Answer all questions in section A and section B.
- Answer the questions in English.
- All answers **MUST** be written in the spaces provided in the paper.
- Do **NOT** remove any page from this question paper.

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SCORE RANG E	30 MAR KS	50 MAR KS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POI NTS	7 POI NTS	6 POI NTS	5 POI NTS	4 POI NTS	3 POI NTS	2 POI NTS	1 POI NT
LEARN ER'S TOTA L SCOR E											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. a) Define the following terms:

i. **Media** (1 mark)

ii. **Media technology** (1 mark)

b) State **two forms of media** used for content creation. (2 marks)

i. _____

ii. _____

c) State **two ways in which media technology** contributes to society. (2 marks)

i. _____

ii. _____

2. a) Distinguish between **traditional media** and **new media**, giving one example of each. (2 mks)

Traditional Media	New Media

b) Name **three careers** related to Media Technology. (3 marks)

i. _____

ii. _____

iii. _____

3. A school media club has been asked to produce a five-minute documentary about environmental conservation in the school.

a) Name the **three major phases of media production**. (3 marks)

i. _____

ii. _____

iii. _____

b) State **one major activity** carried out during each of the following phases: **(3 marks)**

i. Pre-production: _____

ii. Production: _____

iii. Post-production: _____

4. Match each media personnel below with the most appropriate responsibility by writing the responsibility beside the name.

a) **Producer (1 mark)**

b) **Camera operator (1 mark)**

c) **Sound recordist (1 mark)**

d) **Editor (1 mark)**

5. A learner photographs a classmate without permission and uploads the photograph to a social media platform with a misleading caption.

a) Identify **two ethical issues** raised by this action. **(2 marks)**

i. _____

ii. _____

b) State **two responsible practices** that should be followed when using photographs or other people's media content. **(2 marks)**

i. _____

ii. _____

c) State **one reason why copyright is important in media production**. **(1 mark)**

6. a) State **two advantages of digital media** over some traditional media platforms. (2 marks)

i. _____

ii. _____

b) Explain **three factors that should be considered when selecting a media platform for a particular audience.** (3 marks)

i. _____

ii. _____

iii. _____

SECTION B: 50 MARKS

Answer **ALL** questions in this section.

2. Study the simplified camera diagram below.



a) Identify components **A, B, C, D** and **E**. (5 marks)

A. _____

B. _____

C. _____

D. _____

E. _____

b) State **one function** of each of the following:

i. Component B _____ (1 mark)

ii. Component C _____ (1 mark)

iii. Component D _____ (1 mark)

d) State **two camera accessories** that could improve the quality or safety of photography.
(2 marks)

i. _____

ii. _____

3. A Grade 10 learner is assigned to photograph a school athletics competition.

a) Identify the most suitable photography genre for this assignment. (1 mark)

—

b) Give **two reasons** why the genre identified in (a) is suitable. (2 marks)

i. _____

ii. _____

c) State **four techniques** the learner should consider when photographing fast-moving athletes.
(4 marks)

i. _____

ii. _____

iii. _____

iv. _____

d) Explain **three ways in which lighting** can affect the quality of a photograph. (3 marks)

i. _____

ii. _____

iii. _____

4. Study the studio arrangement below.



a) Identify **four pieces of equipment** shown in the image above. **(4 marks)**

Q. _____

R. _____

S. _____

T. _____

b) State **one function** of each of the following:

i. Camera _____ **(1 mark)**

ii. Microphone _____ **(1 mark)**

iii. Mixer _____ **(1 mark)**

c) Explain **three factors that should be considered when arranging lighting in a studio.**

(3 marks)

i. _____

ii. _____

iii. _____

5. A school radio club is preparing a ten-minute programme about responsible use of social media.

a) Identify **three types of sound** that may be incorporated into the programme. **(3 marks)**

i. _____

ii. _____

iii. _____

b) State the function of each type of sound identified in (a). **(3 marks)**

i. _____

ii. _____

iii. _____

c) Name **two pieces of equipment or accessories** required when recording the programme. **(2 marks)**

i. _____ ii. _____

d) State **two measures for obtaining good-quality audio during recording**. **(2 marks)**

i. _____

ii. _____

6. A learner records a short video advertisement for a locally produced school bag. The raw video contains unwanted sections, uneven sound and poorly framed shots.

a) State **three post-production activities** that could improve the video. **(3 marks)**

i. _____

ii. _____

iii. _____

b) Name **two types of software or applications** that may be used for video editing. **(2 marks)**

i. _____

ii. _____

c) Explain **two reasons why the final video should be exported in an appropriate format and resolution.** (2 marks)

i. _____

ii. _____

d) The learner wants to turn the video-production skill into a small media enterprise.

State **three factors** the learner should consider when starting the enterprise. (3 marks)

i. _____

ii. _____

iii. _____

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

METAL TECHNOLOGY

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

- Write your name in the spaces provided above.
- Write the name of your school and your stream in the spaces provided.
- Write your admission number and the date of the assessment in the spaces provided.
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- Answer all questions in section A and section B.
- Answer the questions in English.
- All answers **MUST** be written in the spaces provided in the paper.
- Do **NOT** remove any page from this question paper.

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SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. a) Define the term **Metal Technology**. (2 marks)

b) State **two reasons** why Metal Technology is important to a learner in Kenya. (2 marks)

i. _____

ii. _____

2. A learner intends to establish a small metalworking enterprise after completing school.

a) State **two business activities** related to Metal Technology that the learner could undertake. (2 marks)

i. _____

ii. _____

b) State **two qualities** that a successful metalworker should possess. (2 marks)

i. _____

ii. _____

3. Study the workshop situation described below.

A learner enters a metal workshop wearing open shoes. He places a hacksaw and a file on the floor after use. Another learner is grinding metal without wearing eye protection. Oil has also been spilled near the workbench.

a) Identify **four unsafe practices** in the workshop. (4 marks)

i. _____

ii. _____

iii. _____

iv. _____

b) State **one possible accident** that may result from the spilled oil. (1 mark)

4. Study the simplified diagrams below.

FIGURE 1



FIGURE 2



FIGURE 3



a) Identify the tools represented by **Figure 1, Figure 2 and Figure 3. (3 marks)**

Figure 1: _____

Figure 2: _____

Figure 3: _____

b) State **one use** of any one of the tools identified above. **(1 mark)**

5. a) State the function of each of the following tools.

i. **Steel rule (1 mark)**

ii. **Scriber (1 mark)**

iii. **Try square (1 mark)**

b) State **one reason** why accurate marking out is important before cutting metal. **(1 mark)**

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

b) Give **one example** of each. (2 marks)

- i. *Ferrous metal*: _____
- ii. *Non-ferrous metal*: _____

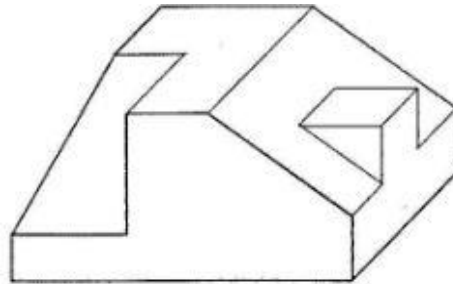
7. Complete the following statements.

- a) A metal that can be drawn into wires is said to possess _____. (1 mark)
- b) A metal that can be beaten into thin sheets possesses _____. (1 mark)
- c) State **one suitable use of copper** in everyday life and give a reason for your choice. (2 marks)

Use:

Reason:

8. The figure below shows an oblique drawing of a block.



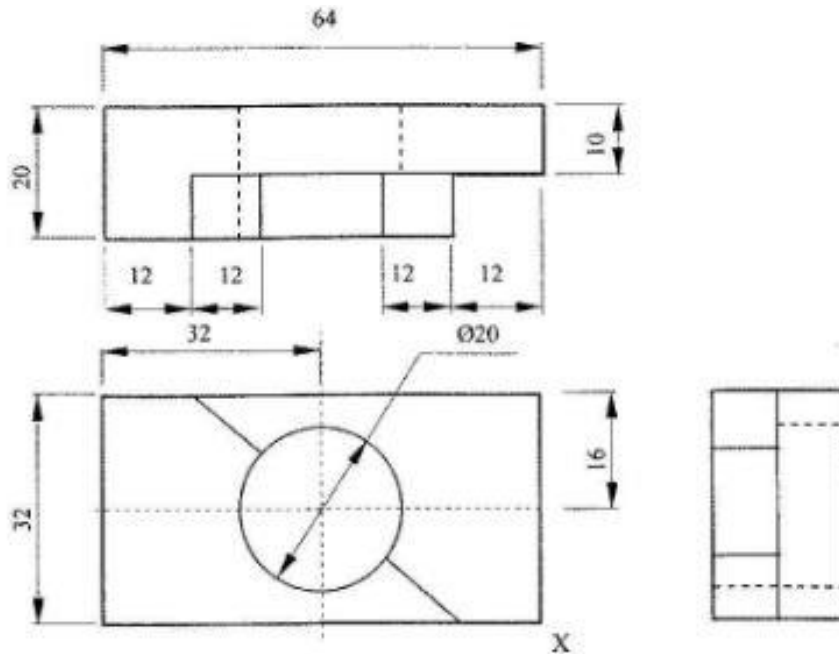
Sketch in third angle projection the three orthographic views of the block.

(3 marks)

SECTION B: 50 MARKS

Answer question 9 and any FOUR others in this section.

- i) Figure 2 shows orthographic views of a machined block drawn in third angle projection,



On the grid paper provided, draw the isometric view of the block taking X as the lowest point.

Show three leading dimensions. **(10 marks)**

- j) A Grade 10 learner is preparing a mild-steel component in the workshop.

- a) Name **four categories of hand and bench tools** used in metalworking. **(4 marks)**

- i. _____
- ii. _____
- iii. _____
- iv. _____

- b) For each of the following tools, state **one appropriate use**.

- i. **Hacksaw (1 mark)**

- ii. **File (1 mark)**

- iii. **Ball-pein hammer (1 mark)**

- iv. **Bench vice (1 mark)**

c) State **two ways of caring for metalworking hand tools** after use. **(2 marks)**

- i. _____
- ii. _____

k) A local workshop requires materials for making the following products:

- *Electrical connecting wires;*
- *A strong structural support;*
- *A lightweight cooking utensil;*
- *A component requiring resistance to corrosion.*

a) Select a suitable metal for **each** of the following applications. **(4 marks)**

- i. Electrical connecting wires: _____
- ii. Structural support: _____
- iii. Lightweight cooking utensil: _____
- iv. Corrosion-resistant component: _____

b) Explain **two differences** between ferrous and non-ferrous metals. **(4 marks)**

<i>Ferrous Metals</i>	<i>non-ferrous metals</i>

c) State **two factors** that should be considered when selecting a metal for a particular product. **(2 marks)**

- i. _____
- ii. _____

l) The object below is a simple metal component.

a) State the purpose of **dimensioning** in technical drawing. **(2 marks)**

b) Name **two drawing instruments** that may be used when producing an accurate technical drawing. **(2 marks)**

- i. _____
- ii. _____

c) State **two conventions or rules** that should be observed when preparing a technical drawing. **(2 marks)**

- i. _____
- ii. _____

d) Using a ruler and pencil, **draw a neat pictorial representation** of the rectangular metal block shown above. Show the circular hole clearly. **(4 marks)**

m) a) Use sketches to show the difference between a lap joint and a flush lap joint. **(4 marks)**

b) State **two methods/materials** that may be used to join sheet metal. **(3 marks)**

i. _____

ii. _____

iii. _____

c) Explain the procedure for producing a **riveted sheet-metal joint** under the following stages:

i. **Preparation and marking out (1 mark)**

ii. **Positioning and drilling/punching holes (1 mark)**

iii. **Inserting and securing the rivet (1 mark)**

d) State **one safety precaution** to observe when carrying out riveting. **(1 mark)**

n) A Metal Technology learner has been given a project to produce a small sheet-metal container for use in the school workshop.

a) State **two sheet-metal processes** that could be used in producing the container. **(2 marks)**

i. _____

ii. _____

b) Explain the meaning of each of the following sheet-metal processes.

i. **Hollowing (2 marks)**

ii. **Raising (2 marks)**

c) State **two factors** the learner should consider when designing the container. **(2 marks)**

i. _____

ii. _____

e) Give **two reasons** why the finished project should be inspected and evaluated before it is used. **(2 marks)**

i. _____

ii. _____

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

POWER MECHANICS

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

INSTRUCTIONS TO CANDIDATES

- Write your name in the spaces provided above.
- Write the name of your school and your stream in the spaces provided.
- Write your admission number and the date of the assessment in the spaces provided.
- This paper consists of two sections: A and B.
- Answer all questions in section A and section B.
- Answer the questions in English.
- All answers **MUST** be written in the spaces provided in the paper.
- Do **NOT** remove any page from this question paper.
- For technical drawing questions, ensure **all construction steps are clearly shown**

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POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. a) Explain the meaning of **Power Mechanics** as a learning area. (2 marks)

b) State **two activities** carried out in the field of Power Mechanics. (2 marks)

i. _____

ii. _____

c) State **two reasons why Power Mechanics is important in society**. (2 marks)

i. _____

ii. _____

2. a) State **two major changes** that have occurred in automobiles as technology has developed. (2 marks)

i. _____

ii. _____

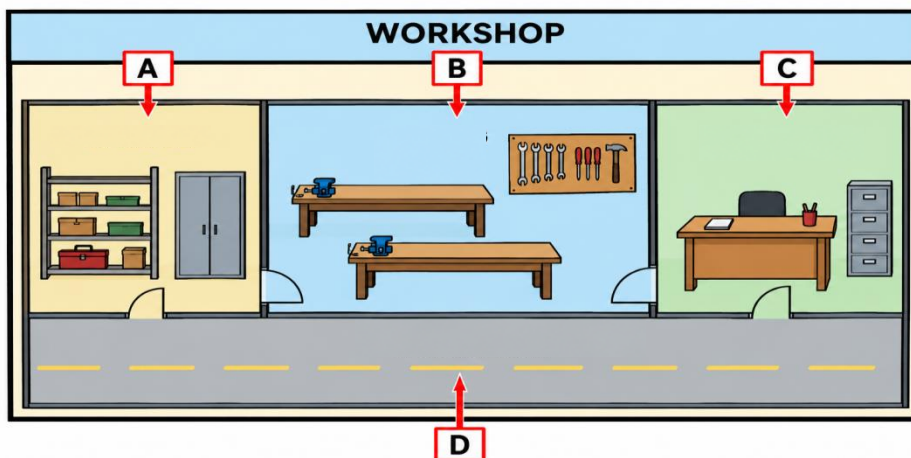
b) Explain **three ways in which innovation has improved modern motor vehicles**. (3 marks)

i. _____

ii. _____

iii. _____

3. The diagram below represents a simplified Power Mechanics workshop.



a) Identify the workshop areas represented by:

i. **A:** _____ (1 mark)

ii. **B:** _____ (1 mark)

iii. **C:** _____ (1 mark)

b) Identify area **D**. (1 mark)

c) State **one reason why passageways should be kept clear** in a Power Mechanics workshop.
(1 mark)

4. a) State **two general workshop rules** that should be observed when carrying out Power Mechanics activities.(2 marks)

i. _____

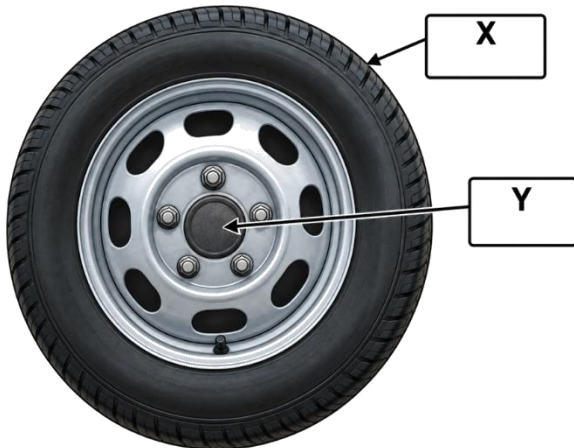
ii. _____

b) State **two possible consequences of ignoring workshop safety rules**. (2 marks)

i. _____

ii. _____

5. Study the simplified road wheel assembly below.



a) Identify the two major parts shown in the diagram. (2 marks)

X. _____

Y. _____

b) State **two functions of a vehicle road wheel**. (2 marks)

i. _____

ii. _____

c) State **one factor that should be considered when selecting a suitable tyre for a vehicle**. (1 mark)

6. a) What is an **engine**? (2 marks)

b) State **two classifications of engines according to the type of fuel used**. (2 marks)

i. _____

ii. _____

c) Give **one example of an application of an engine in everyday life**. (1 mark)

SECTION B 60 MARKS

Answer ALL questions.

7. A learner has been assigned to organise a newly established Power Mechanics workshop.

a) Name **four main areas** that should be provided in the workshop. (4 marks)

i. _____

ii. _____

iii. _____

iv. _____

b) Explain **three reasons why a proper workshop layout is important**. (3 marks)

i. _____

ii. _____

iii. _____

c) State **three considerations when arranging the different areas of a Power Mechanics workshop. (3 marks)**

- i. _____
- ii. _____
- iii. _____

8. During practical work, a learner enters the workshop wearing sandals, operates a machine without protective equipment and leaves a spanner on the floor after completing the task.

a) Identify **three unsafe practices** in the situation. **(3 marks)**

- i. _____
- ii. _____
- iii. _____

b) Explain the risk associated with each unsafe practice identified in (a). **(3 marks)**

- i. _____

- ii. _____

- iii. _____

c) Name **four types of personal protective equipment (PPE)** that may be used in a Power Mechanics workshop. **(4 marks)**

- i. _____
- ii. _____
- iii. _____
- iv. _____

Answer question 9 on the A3 paper provided and any other **three** questions from this section in the spaces provided.

*Candidates are advised to spend **not** more than **25 minutes** on question 9.*

9. The figure below shows an isometric drawing of a bracket.

On the **43** paper provided, draw **FULL SIZE**, in first angle orthographic projection the following views:

- a.** Front Elevation in the direction of arrow W
- b.** End elevation in the direction of arrow X

a. Identify the type of engine by:

- i. type of fuel used _____ (1 mark)
- ii. arrangement of the cylinders _____ (1 mark)
- iii. arrangement of the valves _____ (1 mark)

b. Name the parts labelled A to F. (3 marks)

A. _____

B. _____

C. _____

D. _____

E. _____

F. _____

c. Explain the operation of the valve system of this engine. (4 marks)

11. a) Define the term **locus**. (2 marks)

b) State **two applications of loci in Power Mechanics**. (2 marks)

i. _____

ii. _____

c) What is meant by **tangency** in technical drawing? (2 marks)

d) Explain the meaning of **blending of lines and curves**. (2 marks)

e) Give **two reasons why blending and tangency are important when drawing mechanical components. (2 marks)**

i. _____

ii. _____

12.

a. Illustrate the following frame sections used in a motor vehicle:

i.channel;

ii.box;

iii.tubular.(3 marks)

b. Describe four types of car bodies.(4 marks)

c. Explain the three methods of checking minor chassis frame misalignment.(3 marks)

i. _____

ii. _____

iii. _____

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KENYA SENIOR SCHOOL EDUCATION

GRADE 10 END-TERM 3 EXAMS

SERIES 1 TEST – (STEM PATHWAY)

WOOD TECHNOLOGY

TIME: 2 HOURS

NAME.....

ASSESSMENT NO; SCHOOL;

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

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LEARNER'S TOTAL SCORE											

SECTION A (30MARKS)

Answer ALL questions in this section.

1: a) Define Wood Technology. (1 mark)

b) State **two reasons why Wood Technology is important to an individual learner.** (2 marks)

- i.

- ii.

c) Identify **two career opportunities** related to Wood Technology. (2 marks)

- i.

- ii.

2: A learner enters a woodwork workshop wearing loose clothing. He starts operating a machine without first checking whether the working area is clear. Sawdust is scattered around the machine and several tools have been left on the floor.

a) Identify **two unsafe practices** described in the situation. (2 marks)

- i.

- ii.

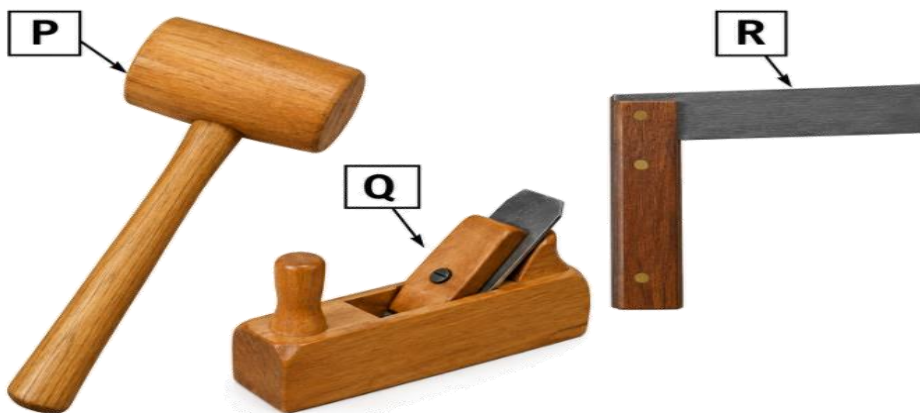
b) State **two measures that should be taken to maintain a safe working environment** in the workshop. (2 marks)

- i.

- ii.

c) Give **one reason why good housekeeping is important in a woodwork workshop.** (1 mark)

3: Study the simplified sketches below.



a) Identify the **type of woodworking tool** represented by each figure. (3 marks)

P: _____

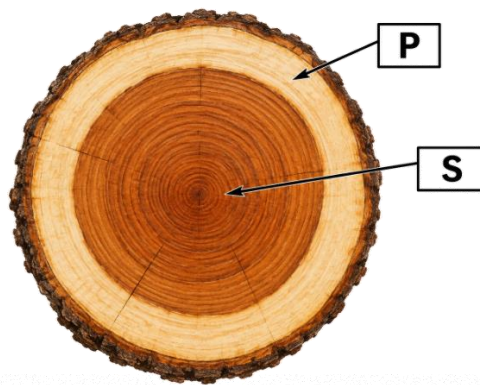
Q: _____

R: _____

b) State **one use of any TWO of the tools identified above**. (2 marks)

TOOL	USE

4: Study the cross-section below.



The diagram represents a simplified cross-section of a tree trunk.

a) Name **two main regions** found in the cross-section of a mature tree trunk. (2 marks)

- i. _____
- ii. _____

b) State **one function of the bark**. (1 mark)

c) Distinguish between **heartwood** and **sapwood**. (2 marks)

5:

a) Distinguish between **hardwood** and **softwood**. (2 marks)

- b) Give **one example of a hardwood tree** and **one example of a softwood tree** commonly associated with timber production. (2 marks)

HARDWOOD	SOFTWOOD

- c) State **one factor considered when selecting timber for making furniture**. (1 mark)

6: A carpenter purchases timber containing knots, splits and fungal discoloration.

- a) What is meant by a **defect in timber**? (1 mark)

- b) Name **two natural defects in timber**. (2 marks)

- i. _____
- ii. _____

- c) State **two ways in which defects in timber can affect the quality of a finished product**. (2 marks)

- i. _____
- ii. _____

SECTION B: 50 MARKS

Answer **ALL** questions in this section.

7: A school intends to purchase freshly converted timber for the construction of wooden desks.

- a) Explain what is meant by **conversion of timber**. (2 marks)

- b) State **three methods of converting timber**. (3 marks)

- i. _____
- ii. _____
- iii. _____

c) Explain **three reasons why timber should be seasoned before being used for furniture construction.**(3 marks)

- i. _____

- ii. _____

- iii. _____

d) State **two methods of seasoning timber.** (2 marks)

- i. _____
- ii. _____

8: A learner has been asked to prepare a piece of timber for making a small shelf.

a) Name a suitable tool for each of the following operations: (4 marks)

- i. Measuring the timber. _____
- ii. Marking a straight line. _____
- iii. Cutting the timber across the grain. _____
- iv. Smoothing a wooden surface. _____

b) Explain **three principles that should guide the selection of a woodworking tool for a particular operation.**(3 marks)

- i. _____

- ii. _____

- iii. _____

c) Describe **three ways of caring for and maintaining hand woodworking tools.** (3 marks)

- i. _____

- ii. _____

- iii. _____

9: Study the simplified sketches below.

a) Identify the type of joint represented by **ANY TWO** of the figures. (2 marks)

E: _____

F: _____

G: _____

b) State **two factors to consider** when selecting a woodwork joint for a particular product. (2 marks)

i. _____

ii. _____

c) Explain **three ways of strengthening a wooden joint**. (3 marks)

i. _____

ii. _____

iii. _____

d) State **three qualities of a good woodwork joint**. (3 marks)

i. _____

ii. _____

iii. _____

10: A learner is constructing a small household table using timber and intends to combine timber with another material.

a) Define a **wood adhesive**. (1 mark)

b) State **three desirable characteristics of a good wood adhesive**. (3 marks)

i. _____

ii. _____

iii. _____

c) Give **three examples of materials that may be combined with wood when making products.**

(3 marks)

- i. _____
- ii. _____
- iii. _____

d) Explain **three factors that should be considered when selecting an adhesive for a woodworking project.**(3 marks)

- i. _____

- ii. _____

- iii. _____

11: A school has commissioned a learner to design and make a small wooden coffee table.

a) State **two purposes of applying a finish to a wooden product.** (2 marks)

- i. _____
- ii. _____

b) Name **four types of wood finishes.** (4 marks)

- i. _____
- ii. _____
- iii. _____
- iv. _____

c) Outline the **four main stages of preparing a wooden surface before applying a finish.** (4 marks)

- i. _____
- ii. _____
- iii. _____
- iv. _____

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