

Name Index Number/.....

237/2
GENERAL SCIENCE
Paper 2
Oct./Nov. 2014
2 $\frac{1}{2}$ hours

Candidate's Signature

Date



THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education
GENERAL SCIENCE
Paper 2
2 $\frac{1}{2}$ hours

Instructions to Candidates

- (a) Write your name and index number in the spaces provided above.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) This paper consists of **three** sections: **A**, **B** and **C**.
- (d) Answer **all** the questions in sections; **A**, **B** and **C**.
- (e) **All** answers must be written in the spaces provided.
- (f) **This paper consists of 18 printed pages.**
- (g) **Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**
- (h) **Candidates should answer the questions in English.**

For Examiner's Use Only

Section	Questions	Maximum Score	Candidate's Score
A	1-10	34	
B	11-20	33	
C	21-35	33	
Total Score			

SECTION A: BIOLOGY (34 marks)

Answer ALL the questions in this section in the spaces provided.

1 Differentiate between ecology and ecosystem. (2 marks)

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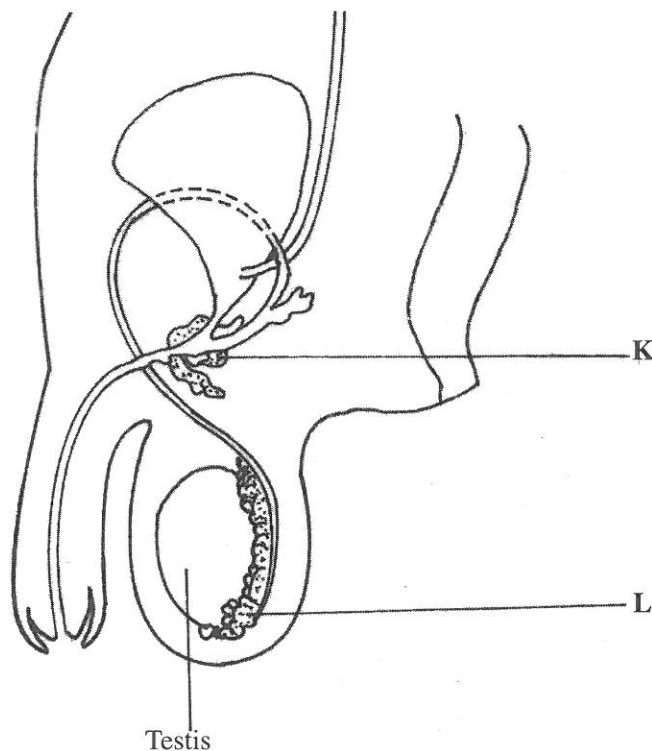
2 (a) Name **three** air pollutants produced when charcoal is burnt in a poorly ventilated room. (3 marks)

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(b) Name the causative agent of amoebic dysentery. (1 mark)

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3 The diagram below represents the human male reproductive system.



(a) (i) Name the parts labelled **K** and **L**.
K; (1 mark)

.....
L. (1 mark)

.....
(ii) State the role of the hormone produced by the testis. (1 mark)

.....
(b) What is meant by the term mitosis? (1 mark)

.....
4 (a) What is gestation period? (1 mark)

.....
(b) State **two** symptoms of Herpes simplex. (2 marks)

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(c) What is a genotype? (1 mark)

.....
5 (a) State the meaning of seed viability. (1 mark)

(b) State **two** reasons why water is required for seed germination. (2 marks)

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6 (a) Giving an example, describe continuous growth in animals. (2 marks)

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(b) Distinguish between the terms homozygosity and heterozygosity. (2 marks)

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7 (a) What is chemical evolution? (2 marks)

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(b) State **two** ways in which meiosis is important in sexual reproduction. (2 marks)

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8 State the meaning of the following terms: (3 marks)

(a) irritability;

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(b) stimulus;

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(c) response.

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9 Name **three** structures of the human ear that are involved in balance and posture. (3 marks)

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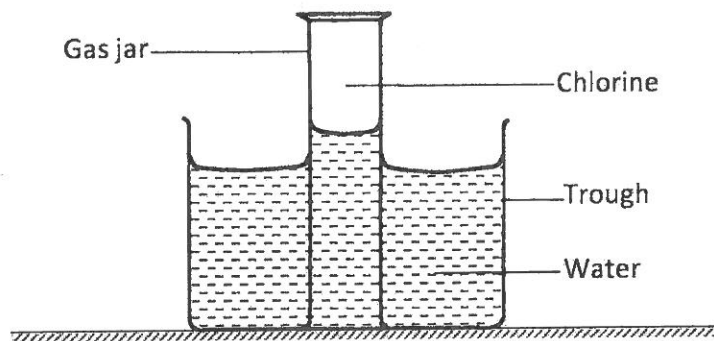
10 State **three** functions of an endoskeleton. (3 marks)

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SECTION B: CHEMISTRY (33 marks)

Answer *ALL* the questions in this section in the spaces provided.

- 11 The set-up shown below was used to investigate some properties of chlorine gas.



- (a) Explain why the level of water in the gas jar was higher than in the trough after some time. (1 mark)

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- (b) (i) What would be observed if blue litmus paper was dipped into the water in the trough? (1 mark)

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- (ii) Explain the observations made in b(i) above. (2 marks)

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- 12 Calculate the number of moles contained in 30g of potassium nitrate
(K = 39.0; N = 14.0; O = 16.0).

(2 marks)

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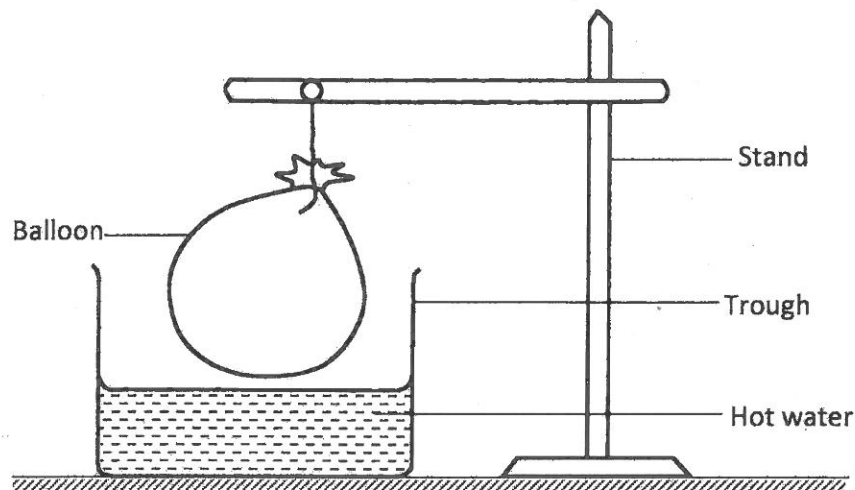
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- 13 A balloon filled with air was tied and held above a trough containing hot water as shown in the diagram.



- (a) State the observation made on the balloon.

(1 mark)

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(b) Explain the observation in (a) above. (2 marks)

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14 (a) What is meant by the term **dilution**? (1 mark)

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(b) Calculate the mass in grams contained in 25.0 cm³ of 0.2M sodium hydroxide solution (Na = 23.0; O = 16.0; H = 1.0). (2 marks)

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15 (a) Name **one** natural polymer and state its use. (1 mark)

Natural polymer.

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Use.

.....

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- (b) State **one** advantage and **one** disadvantage of synthetic polymers. (1 mark)

Advantage

.....

Disadvantage

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- 16 (a) Iron metal exists naturally in different ores. Other than haematite, name another common ore of iron. (1 mark)

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- (b) During the extraction of iron metal, one of the reactions in the blast furnace is:



- (i) Name the raw material that is used to produce carbon (II) oxide. (1 mark)

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- (ii) Iron metal produced in the reaction is in liquid state. Explain. (1 mark)

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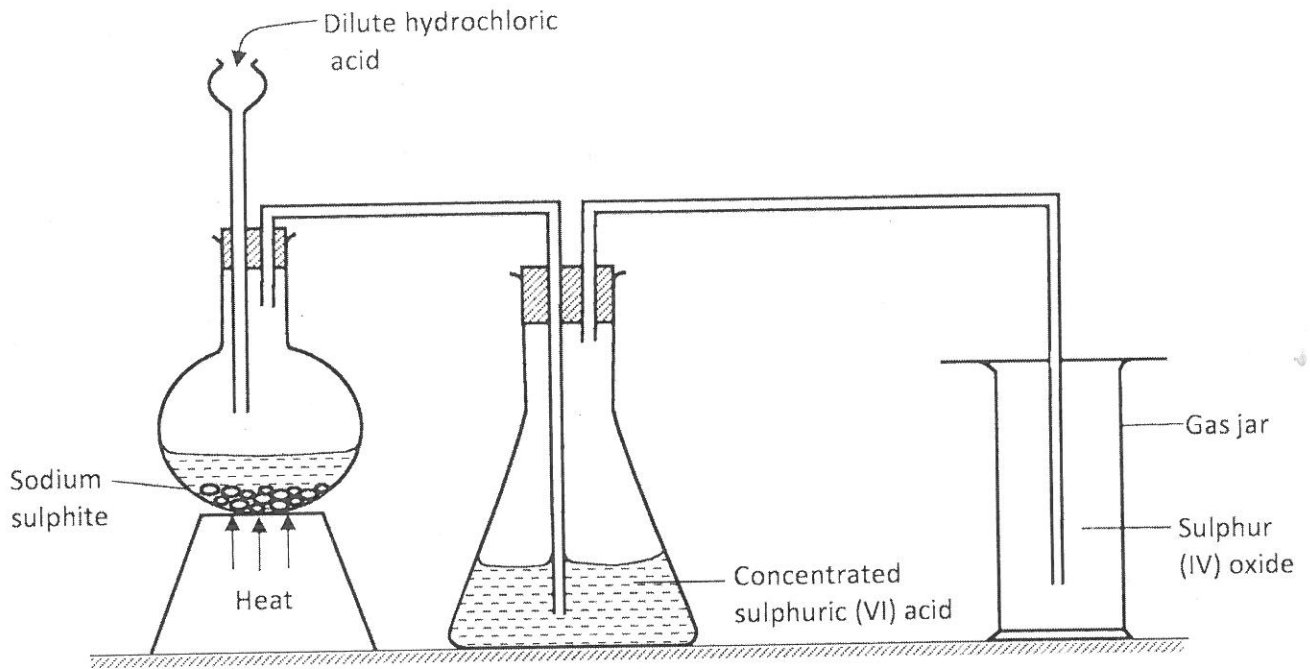
- (c) State with a reason, **one** use of stainless steel. (2 marks)

Use:

Reason:

.....

- 17 The set-up shown below was used by a student to prepare sulphur (IV) oxide gas. Study it and answer the questions that follow.



- (a) (i) Identify a mistake on the set-up that will affect collection of sulphur (IV) oxide gas. ($\frac{1}{2}$ mark)

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- (ii) How would the mistake be corrected? ($\frac{1}{2}$ mark)

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- (b) (i) State the use of concentrated sulphuric (VI) acid in the above set-up. (1 mark)

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- (ii) What would happen if concentrated sulphuric (VI) acid was replaced with water? (1 mark)

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- (c) State **one** use of sulphur (IV) oxide gas. (1 mark)

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18 When Potassium chloride was dissolved in water, the following change occurred.



- (a) (i) State the type of energy change in the above reaction. (1 mark)

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- (ii) The above experiment was done in a boiling tube. State the observation that was made. (1 mark)

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- (iii) Name the type of reaction in a(ii) above. (1 mark)

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- (b) Name **two** factors considered when choosing a fuel. (2 marks)

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- 19 (a) Name the compound $\text{CH}_3\text{CHCHCH}_3$. (1 mark)

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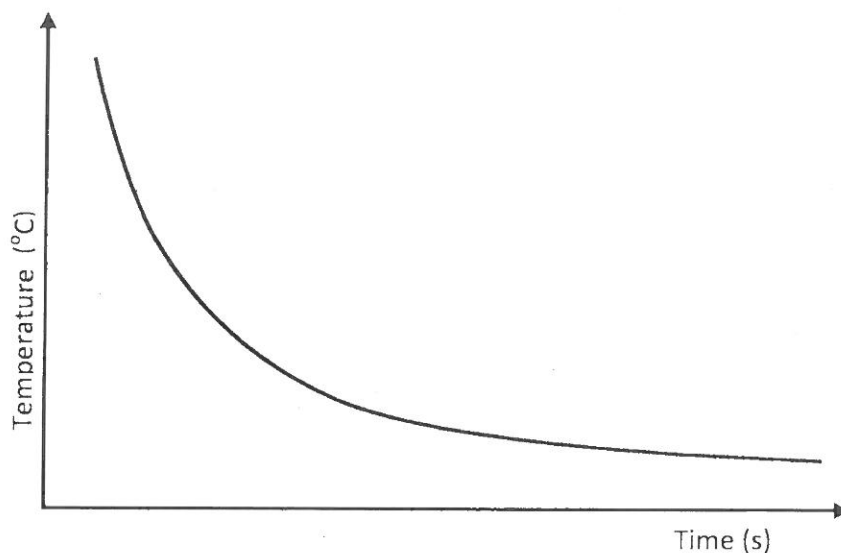
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- (b) Name the type of reaction that takes place when the compound in (a) above is reacted with hydrogen chloride gas. (1 mark)

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- 20 0.1M hydrochloric acid was reacted with sodium thiosulphate solution. The time taken for the cross to disappear was recorded at different temperatures as shown on the graph.



- (a) Explain the shape of the curve. (1 mark)

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- (b) What conclusion would be made from the curve? (1 mark)

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- (c) Sketch another curve on the same axis that would be obtained when the concentration of hydrochloric acid is doubled. (1 mark)

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SECTION C: PHYSICS (33 marks)

Answer ALL the questions in this section in the spaces provided.

- 21 **Figure 1**, shows an image I formed when an object O is placed in front of a convex mirror.

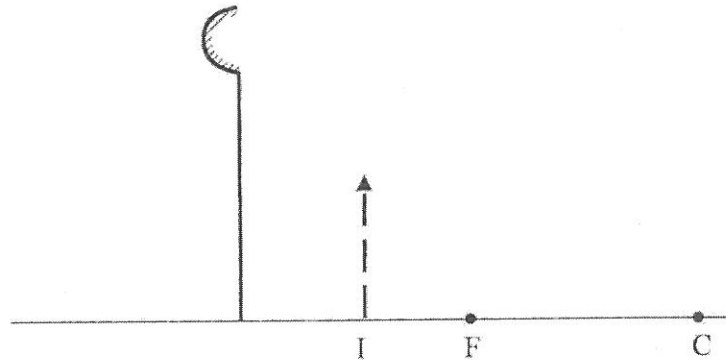


Figure 1

Complete the ray diagram to show the position of object O. (3 marks)

- 22 When a polythene rod is rubbed with a dry piece of cloth, and then brought near a negatively charged pith ball, the ball is observed to move away. Explain this observation. (2 marks)

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- 23 (a) Name **one** defect of a simple cell. (1 mark)

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- (b) State how the defect in (a) above is minimized. (1 mark)

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24 **Figure 2** shows iron keepers used in storing bar magnets.

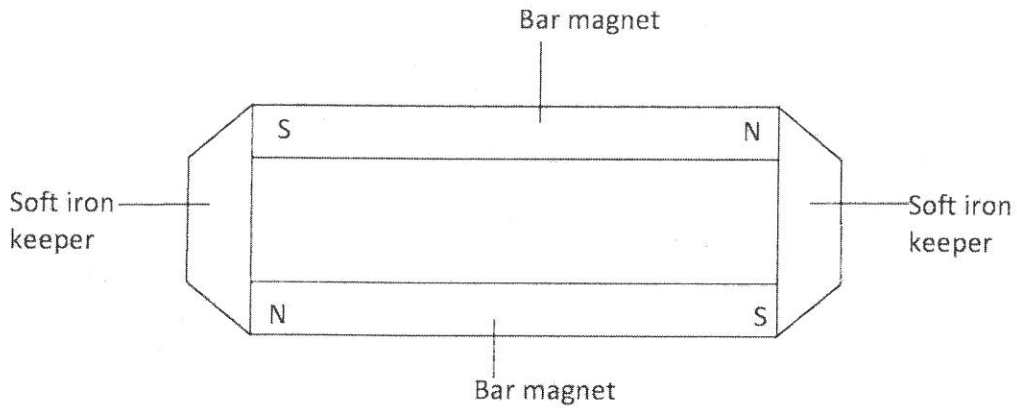


Figure 2

On the figure show the poles induced in the keepers. (1 mark)

25 **Figure 3**, shows an arrow which indicates the direction of travel of a wave in a medium. P, a particle of the medium is in the path of the wave.



Figure 3

In the space provided, sketch the diagram to show how the particle P moves when the wave is

- (a) transverse.
 - (b) longitudinal
- (2 marks)

26 State **two** factors that affect the speed of sound in air. (2 marks)

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27 Define the term potential difference. (1 mark)

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28 **Figure 4**, shows two circuits X and Y in which two identical coils are used to heat two equal amounts of water. The two circuits are switched on at the same time.

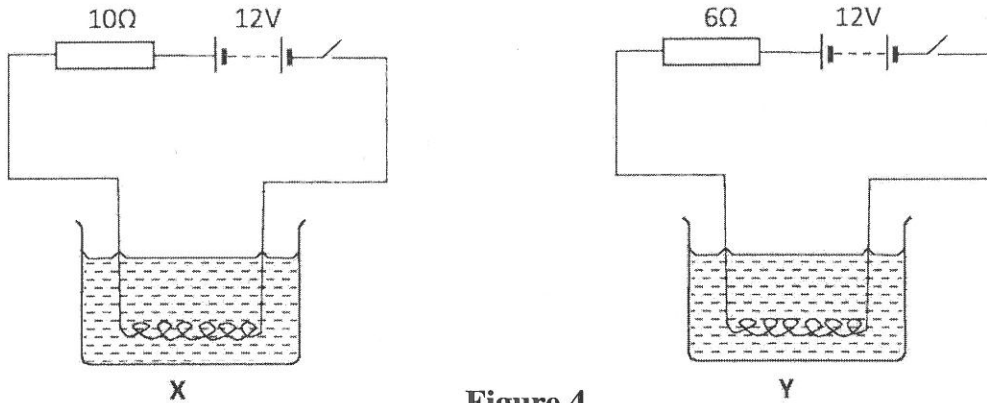


Figure 4

(a) State the circuit in which the water boils first. (1 mark)

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(b) Explain the answer in (a) above. (2 marks)

.....

29 It is observed that a swimming pool full of water appears shallower than it actually is. Explain this observation. (3 marks)

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- 30 **Figure 5**, shows an object O placed in front of a converging lens whose principal foci are F_1 and F_2 .

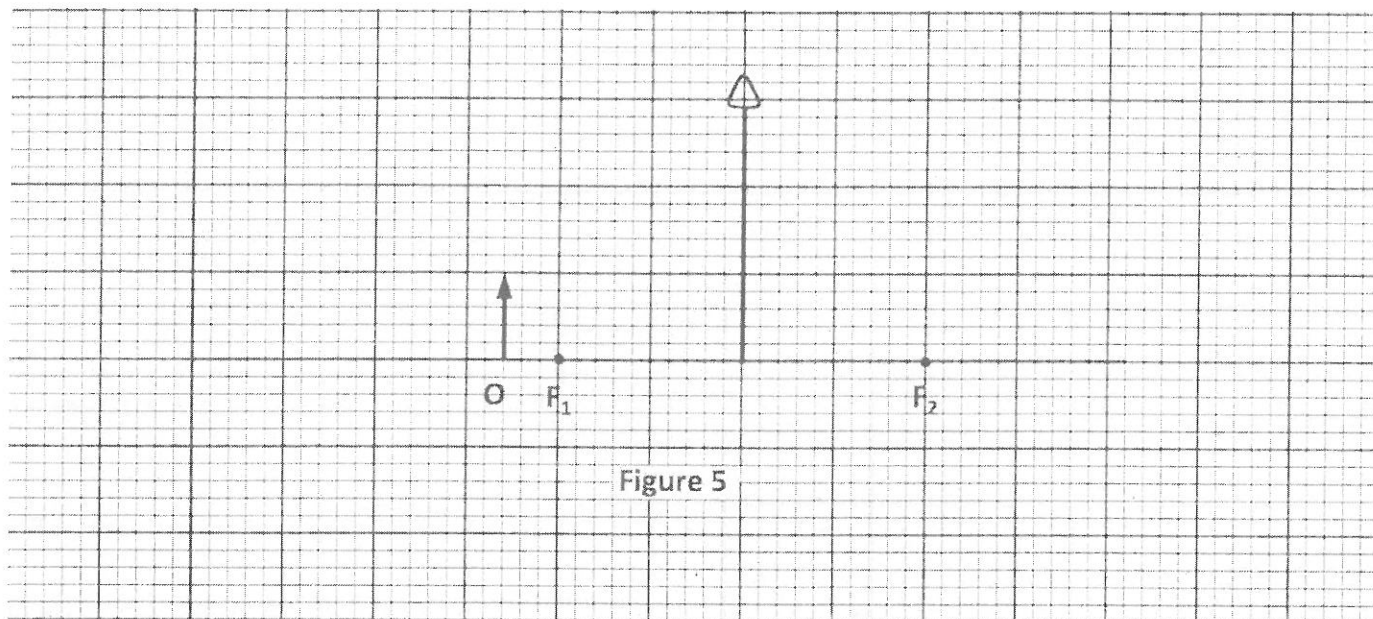


Figure 5

Figure 5

Using rays, complete the diagram to show the position of the image. (3 marks)

- 31 **Figure 6**, shows a displacement - time graph of a wave.

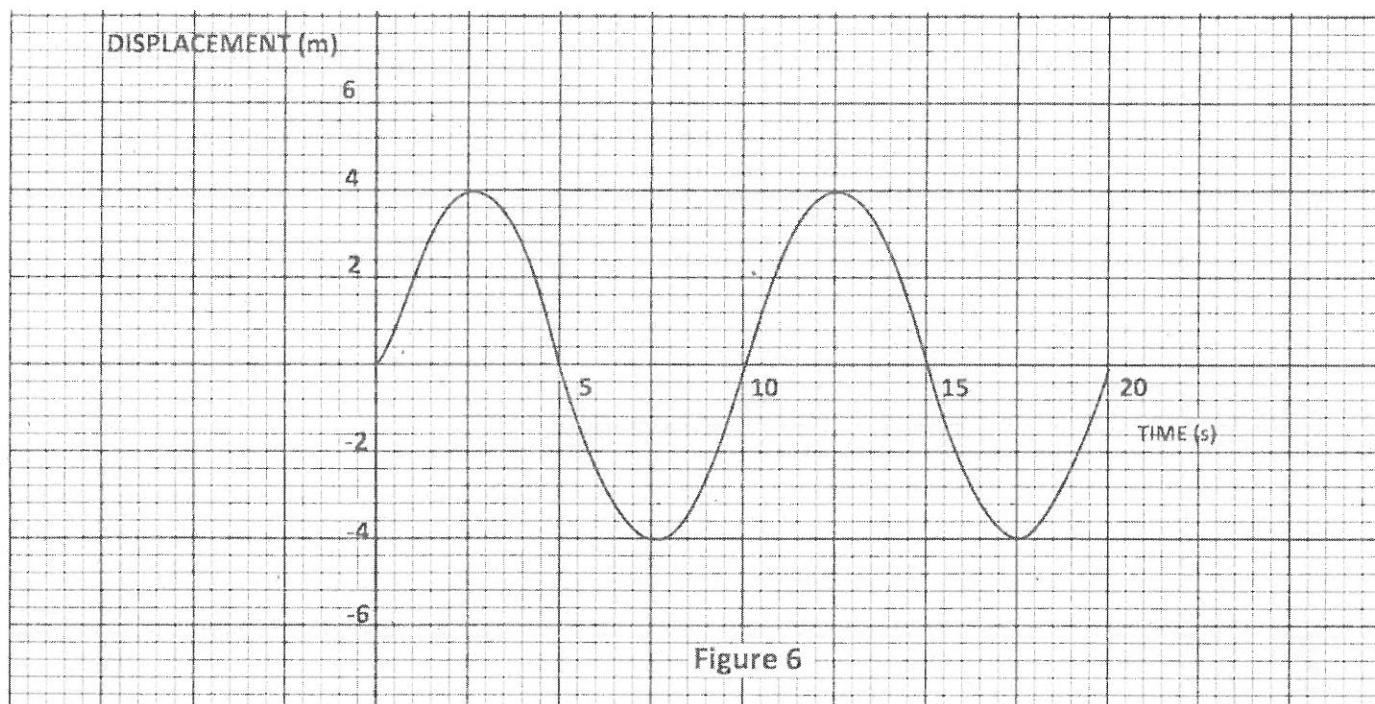


Figure 6

Figure 6

Determine the amplitude of the waveform. (1 mark)

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32 An electric iron is rated 1500 W. Determine the cost of using the iron for 30 hours given that the cost of electricity is Ksh.8 per kilowatt hour. (3 marks)

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33 (a) State **one** way in which the path of a cathode ray can be changed. (1 mark)

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(b) The control grid in a cathode ray oscilloscope (CRO) is used to control the brightness of the spot on the screen. Explain how the brightness of the spot may be reduced. (2 marks)

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34 State **two** ways in which the conductivity of a semiconductor can be increased. (2 marks)

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35 Explain the danger of radioactive emissions on a human body. (2 marks)

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