

Name Index Number

237/1
GENERAL SCIENCE
Paper 1
Oct./Nov. 2012
2½ hours

Candidate's signature

Date



THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education
GENERAL SCIENCE

Paper 1
2½ hours

237/1 - General Science - P1
 Friday 8.00 am - 10.30 am
 9/11/12 (1st Session)

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.

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A	1 - 9	34	
B	10 - 20	33	
C	21 - 33	33	
Total Score			

SECTION A: BIOLOGY (34 marks)

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

- 1 (a) Give **two** reasons why a child requires more energy than an adult. (2 marks)

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- (b) How can the presence of lipids in a food substance be confirmed without using chemical reagents? (2 marks)

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- 2 (a) State **one** example of an organism in the kingdom protocista. (1 mark)

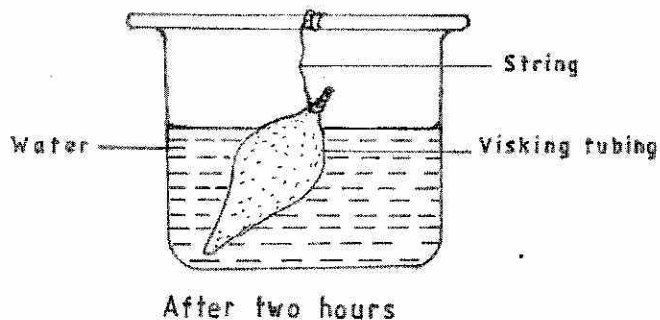
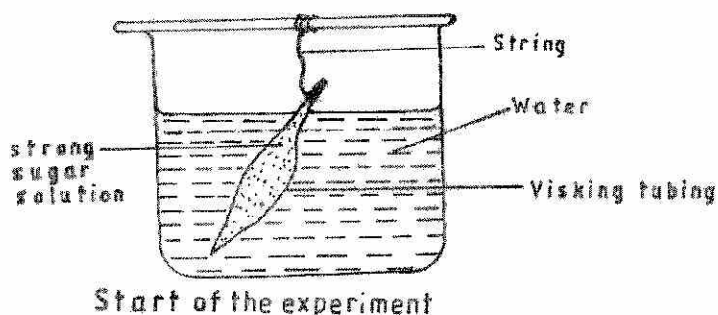
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- (b) Classify maize (*zea mays*) into its first two largest taxonomic units. (2 marks)

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- 3 The diagrams below illustrate a set-up that form one students used to demonstrate a certain physiological process and the result after two hours.



- (a) Name the physiological process that was being demonstrated. (1 mark)

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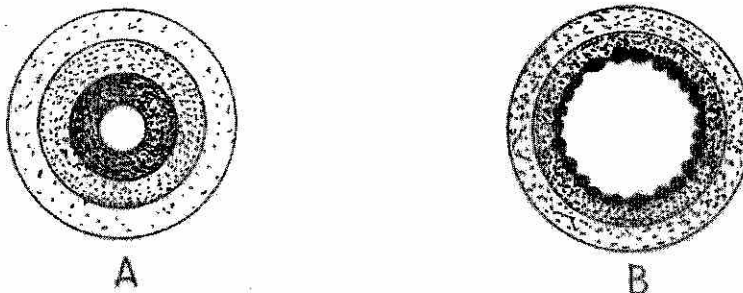
(b) Explain the observation made after two hours. (3 marks)

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4 The diagrams below represent cross sections of human blood vessels.



(a) (i) Name the blood vessel labelled A. (1 mark)

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(ii) Give a reason for your answer in (a) (i) above. (1 mark)

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(b) How is the blood vessel labelled B adapted to its function? (2 marks)

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5 (a) Differentiate between excretion and egestion. (2 marks)

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(b) How does the liver help to maintain a constant body temperature in human beings? (2 marks)

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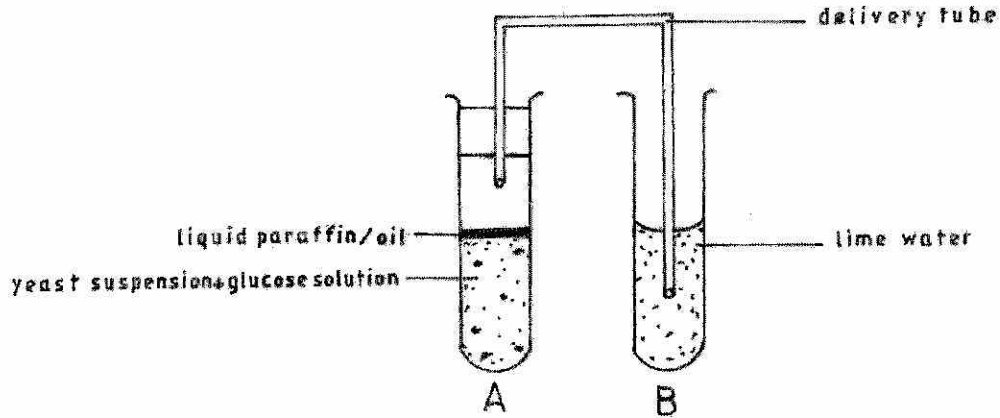
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(c) State **two** causes of kidney stones. (2 marks)

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6 The diagram below shows an experimental set-up to demonstrate a biological process.



(a) Name the process being demonstrated. (1 mark)

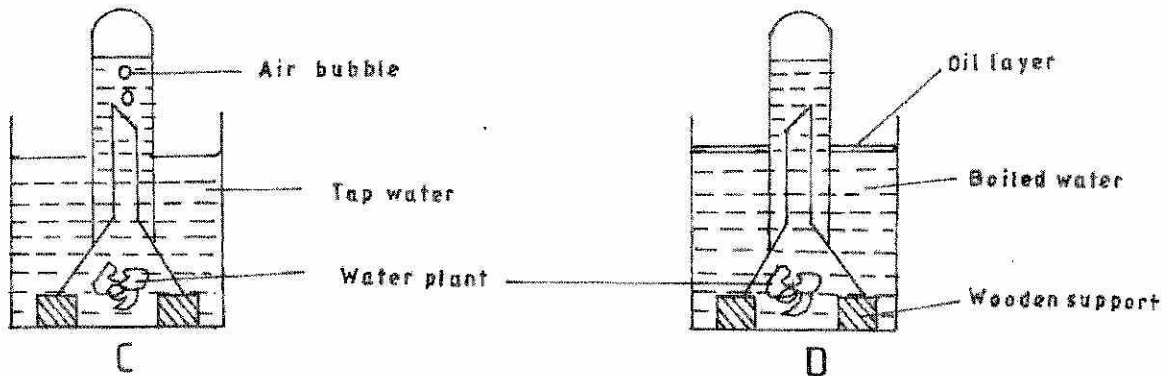
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(b) State the observations made during the demonstration. (2 marks)

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7 Form one students set up an experiment to demonstrate a physiological process as shown in the diagrams below.



(a) Why were bubbles not produced in the set-up labelled D? (2 marks)

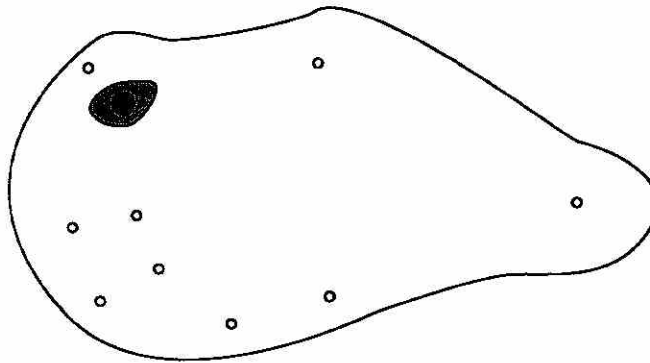
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(b) Name the gas collected in the set-up labelled C. (1 mark)

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- 8 Complete and label the drawing below to make it appear like that of a typical plant cell as seen under a light microscope. (3 marks)



- 9 State **four** factors that affect the rate of breathing in human beings. (4 marks)

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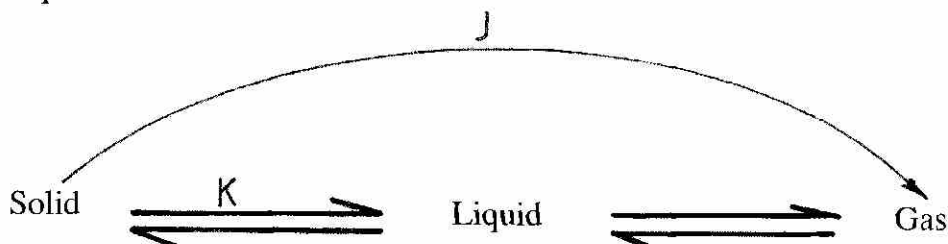
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SECTION B: CHEMISTRY (33 marks)

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

- 10 The diagram below shows changes in states of matter under different conditions. Study it and answer the question that follows.



Give the names of the changes represented by the letters J and K. (1 mark)

J

K

- 11 (a) Complete the following word equation. (1 mark)

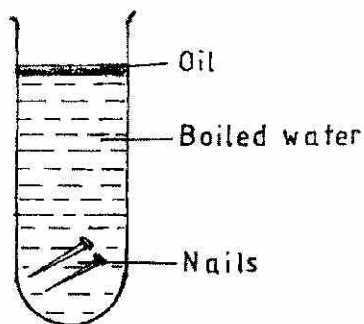


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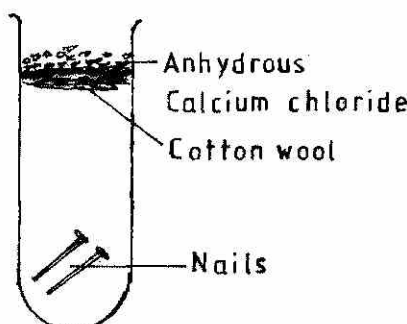
- (b) Give **one** commercial use of sulphuric (VI) acid. (1 mark)

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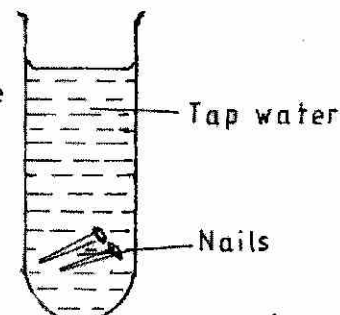
- 12 Three experiments were set up as shown below to investigate the conditions necessary for rusting to occur.



Experiment I



Experiment II



Experiment III

- (a) After three days, only the nails in experiment III had rusted. Why didn't rusting occur in experiments I and II?

I

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(1 mark)

II

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(1 mark)

(b) What would be the effect of using salty water instead of tap water in experiment III? (1 mark)

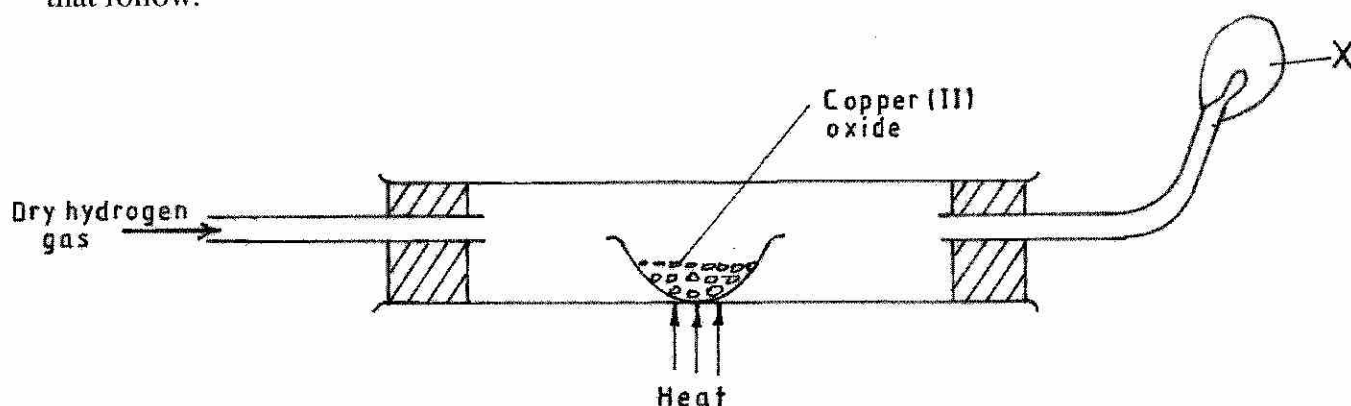
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(c) Complete the table below by stating the type of oxides formed when the following substances are burnt in air. (1 mark)

Substance	Type of oxide
Hydrogen	Neutral
Phosphorus	
Magnesium	

13 The diagram below shows a reduction - oxidation process. Study it and answer the questions that follow.



(a) Write an equation for the reaction between dry hydrogen gas and hot copper (II) oxide. (1 mark)

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(b) In the process above, which substance undergoes oxidation? Explain. (1 mark)

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(c) Name the substance that burns at X? (1 mark)

14 (a) The two main isotopes of carbon are $^{12}_6\text{C}$ and $^{13}_6\text{C}$ with relative abundances of 98.8% and 1.2% respectively. Calculate the relative atomic mass (RAM) of carbon. (2 marks)

(b) The elements X and Y have atomic numbers 13 and 17 respectively. Write the electronic configuration of:

(i) ion of X; (1/2 mark)

(ii) Y..... (1/2 mark)

(c) Write the formula of the compound formed when X reacts with Y. (1 mark)

15 The table below represents part of the periodic table. The letters do not represent the actual symbols of the elements. Use it to answer the questions that follow.

P	Q						R	S
T								

(a) Which element would be most reactive with water? Explain. (2 marks)

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(b) Explain why element S is non-reactive. (1 mark)

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(c) Identify the element which is in the group of alkaline earth metals. ($\frac{1}{2}$ mark)

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(d) Element P and R would react to form a compound PR. What type of bond exists in compound PR? ($\frac{1}{2}$ mark)

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16 (a) Water hardness is classified as either temporary or permanent. What are the causes of permanent hardness in water? (2 marks)

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(b) How is temporary water hardness commonly removed? (1 mark)

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17 Given 50 cm³ of dilute hydrochloric acid in a beaker, describe how solid calcium chloride could be prepared using calcium carbonate. (3 marks)

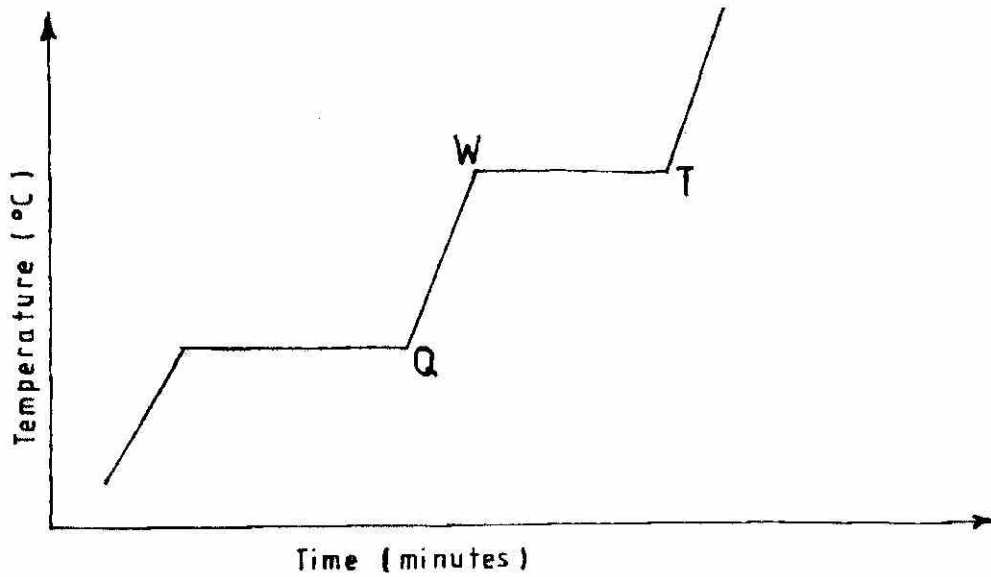
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18 The graph below shows variation of temperature when ice is heated over a period of time.



(a) Using kinetic theory, explain the changes between points:

(i) Q and W(1 1/2 marks)

(ii) W and T(1 1/2 marks)

(b) Name the apparatus that can be used to separate a mixture of water and oil.

(1 mark)

19 (a) Using dot (•) and cross (X) diagram, illustrate the type of bonding in carbon (IV) oxide (Atomic numbers: C = 6; O = 8).

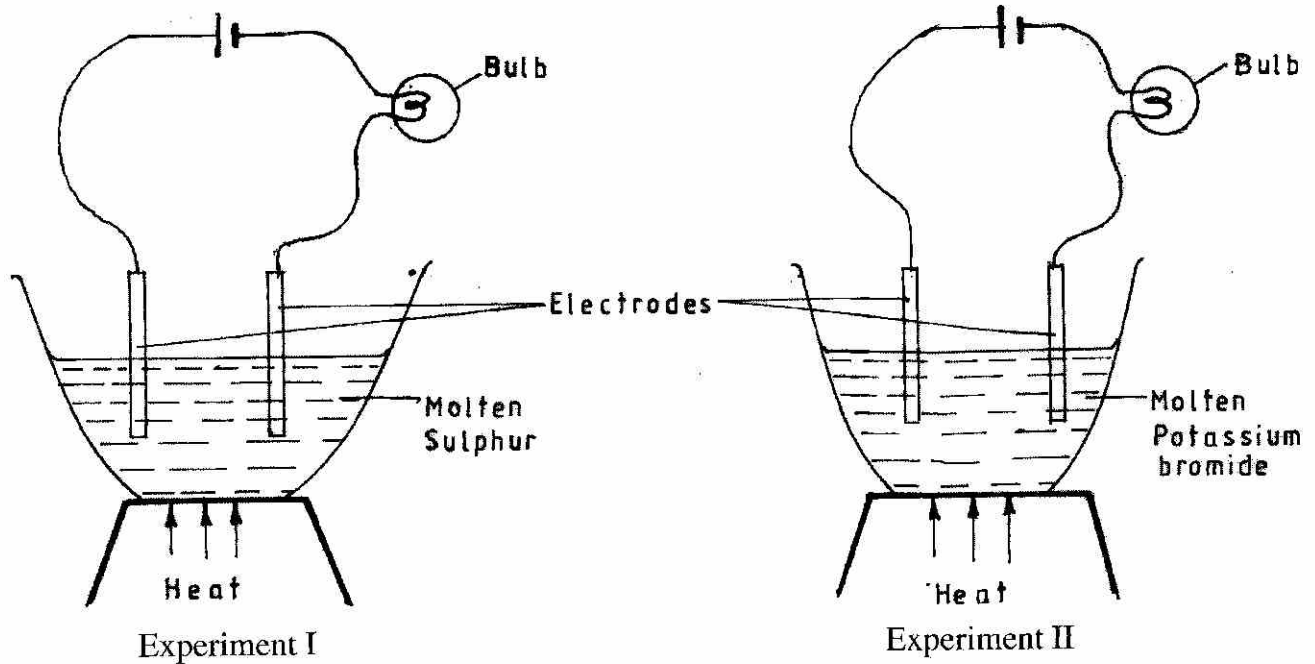
(2 marks)

(b) Give a reason why graphite conducts electricity. (1 mark)

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20 The diagrams below show set-up of experiments done to investigate conduction of electric current by some substances. Study the diagrams and answer the question that follows.



In which experiment does the bulb light? Explain. (2 marks)

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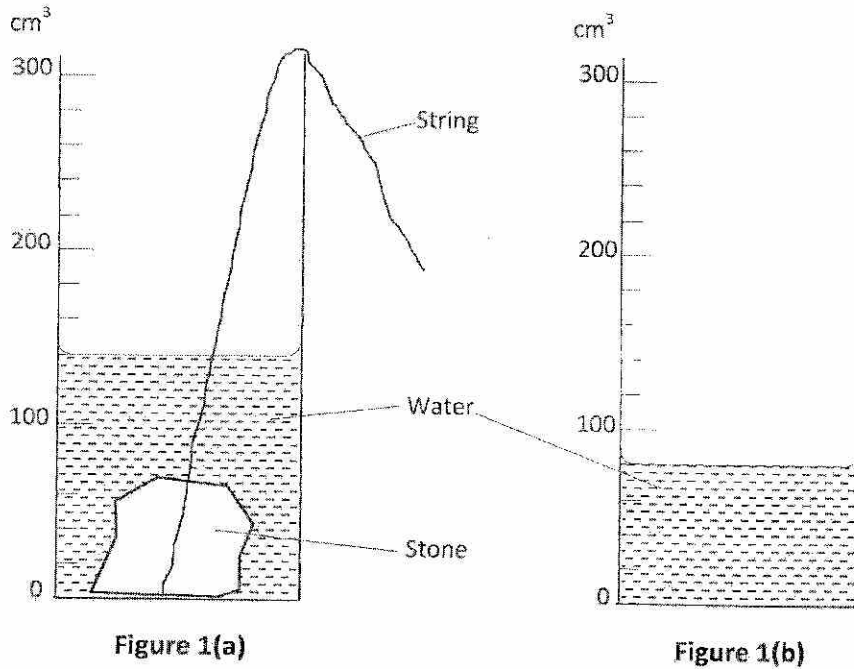
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SECTION C: PHYSICS (33 marks)

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

- 21 **Figure 1(a)** shows a stone of mass 144 g immersed in water. Before the stone was immersed, the level of water was as shown in **figure 1(b)**. Determine the density of the stone. (3 marks)



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- 22 The weight of an object is 23.5 N. Determine the mass of the object given that the acceleration due to gravity is 10 ms^{-2} . (3 marks)

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- 23 (a) State the reason why atmospheric pressure at sea level is greater than at a higher altitude. (1 mark)

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(b) **Figure 2** shows a syringe with its nozzle dipped in a liquid.

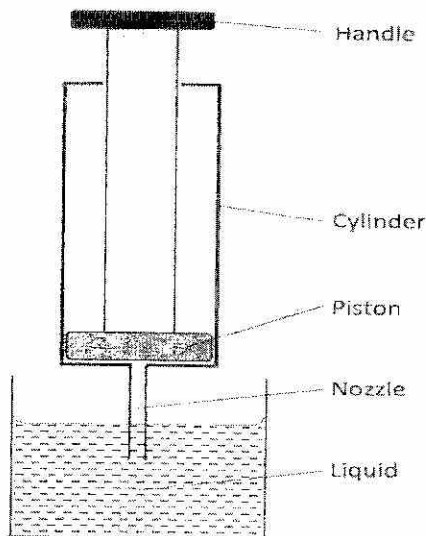


Figure 2

It is observed that when the piston is pulled upwards the liquid enters the cylinder. Explain this observation.

(2 marks)

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24 State the reason why the volume of a gas is always equal to the volume of the vessel containing it. (1 mark)

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25 (a) Define the term temperature. (1 mark)

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- (b) **Figure 3** shows an electric iron box in which a brass-invar bimetallic strip is used to control the temperature.

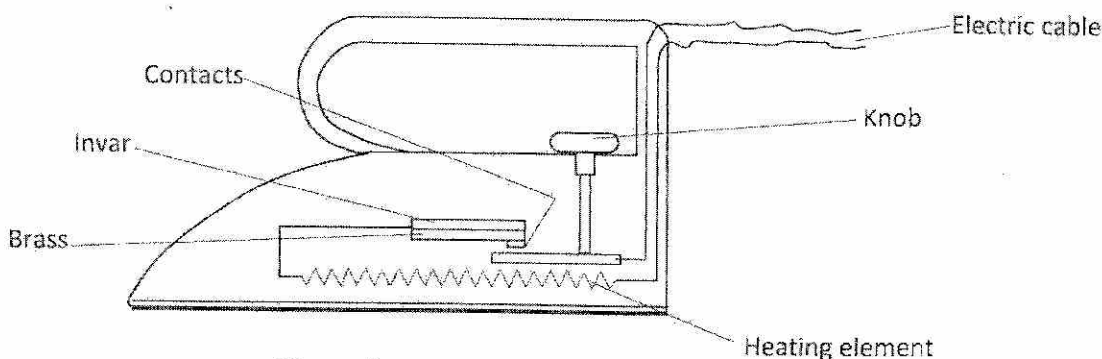


Figure 3

Given that brass expands more than invar, describe how the bimetallic strip controls the temperature of the iron box. (2 marks)

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- 26 When one end of a metal is heated, the other end gets hot. Explain this observation. (2 marks)

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- 27 **Figure 4** shows a uniform rod 120 cm long and weighing 15 N. The rod is pivoted at 20 cm from one end and is balanced by two forces, 10 N and F.

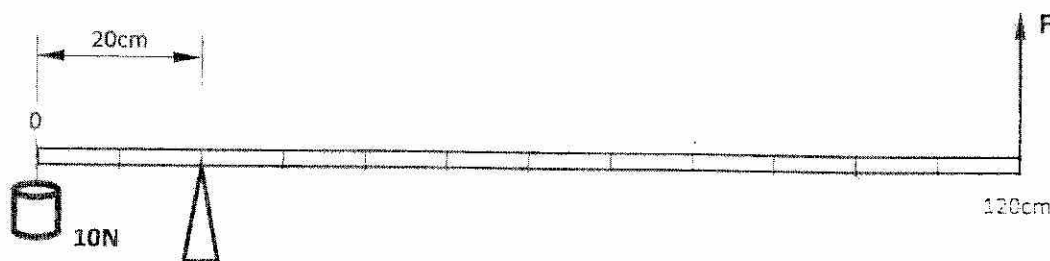


Figure 4

Determine the magnitude of F. (3 marks)

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28 **Figure 5** shows a drinking glass placed upside down on a table.

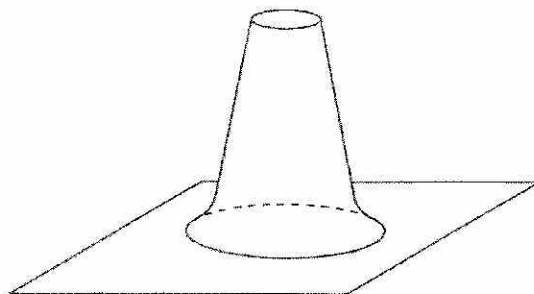


Figure 5

(a) Name its state of equilibrium. (1 mark)

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(b) State a reason for your answer in (a). (1 mark)

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29 Figure 6 shows a graph of force against extension for a spring.

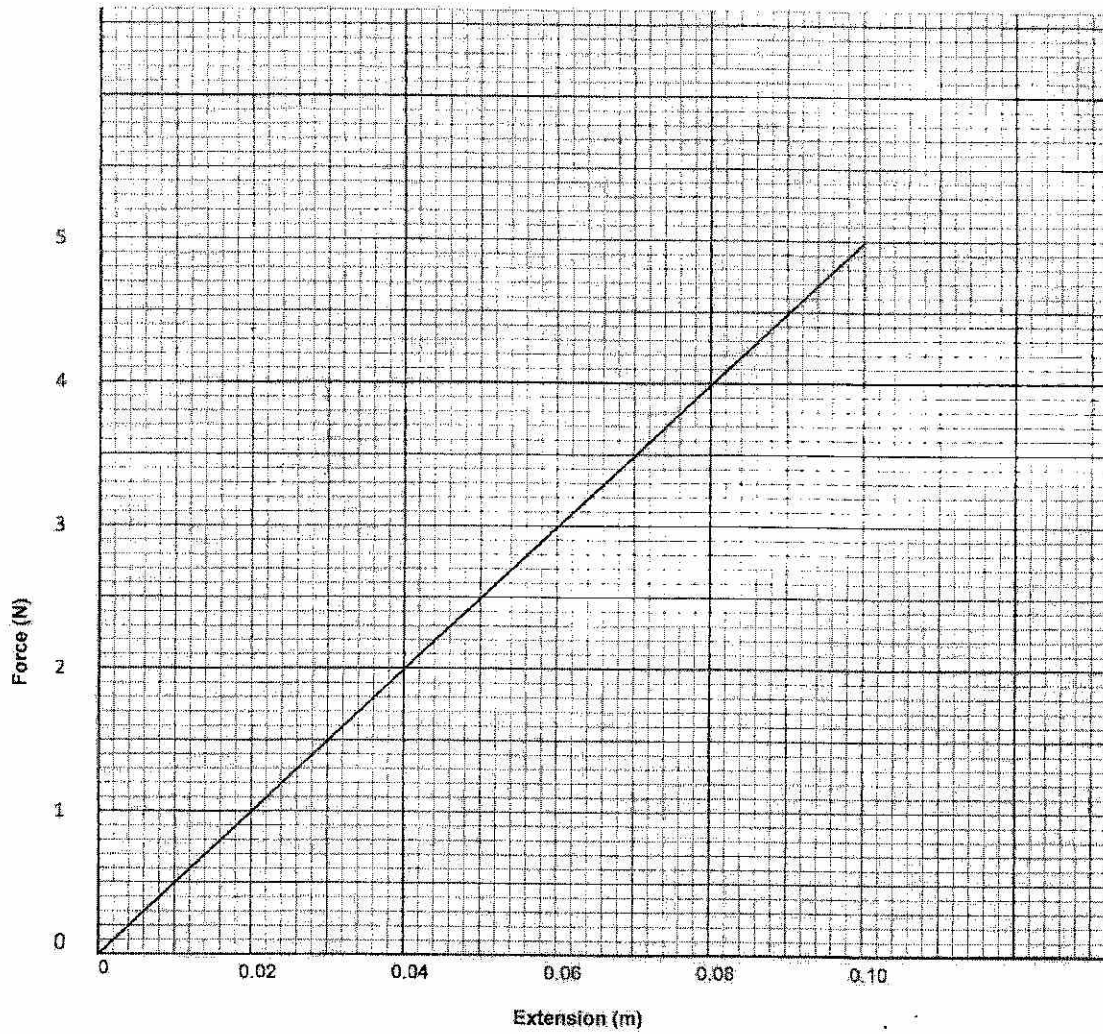


FIGURE 6

Use the graph to determine the spring constant.

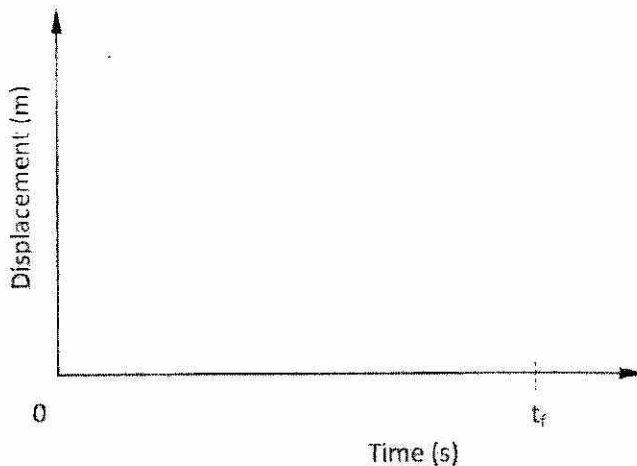
(3 marks)

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- 30 A stone is thrown vertically upwards. On the axes provided sketch the displacement-time graph for the motion of the stone from the time it is thrown to the time, t_f , when it reaches the maximum height. (2 marks)



- 31 Figure 7 shows a wheelbarrow being used to carry a box in the direction shown.

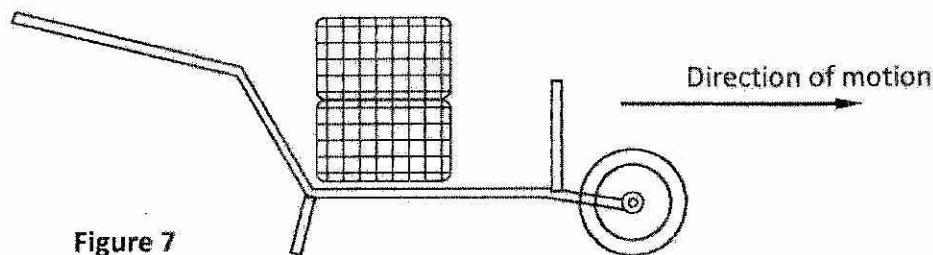


Figure 7

When the wheelbarrow is suddenly stopped the box slides forward. Explain why the box slides forward. (2 marks)

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- 32 (a) Figure 8 shows a hammer being used as a machine to remove a nail from a piece of wood.

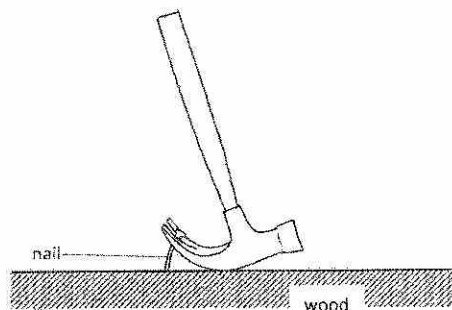


Figure 8

Indicate with an arrow on the hammer, the position where the least effort should be applied to remove the nail. (1 mark)

- (b) Light from the sun is used by a solar panel to charge a car battery. State the energy changes that take place from the sun to the solar panel and finally to the battery. (2 marks)
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33 **Figure 9** shows a metal block suspended from a spring balance and partially immersed in water.

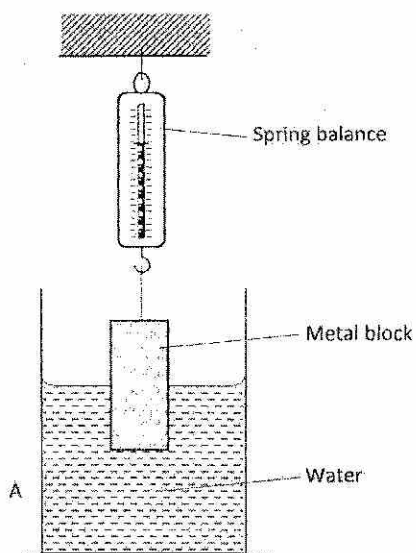


Figure 9

- (a) State what will be observed in the reading of the balance if the block is lowered further into the water. (1 mark)
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- (b) Explain your answer in (a). (2 marks)
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