3.7.2 General Science Paper 2 (237/2)

SECTION A: BIOLOGY (34 marks)

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

1 In the table below, name the causative agent and state one symptom for each of the diseases indicated.

(4 marks)

Disease	Causative agent	Symptom
Gonorrhoea		
Candidiasis		

2 (a) State the functions of each of the following structures in human beings: (3 marks)

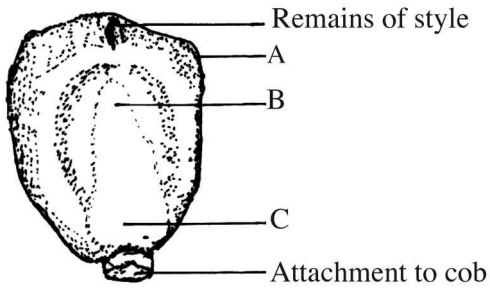
(i) ovary; .....

(ii) uterus; .....

(iii) Cowper's gland. .....

(b) What is implantation? (1 mark)

3 The diagram below represents an external view of a maize grain.



Name the parts labelled A, **B** and **C**. (3 marks)

A .....

B .....

C .....

4 (a) What is fertilisation? (2 marks)

(b) With an example, describe discontinuous growth. (2 marks)

5 (a) What is variation as used in biology? (1 mark)

(b) Explain the following terms: (3 marks)

(i) haploidy;

(ii) genotype;

(iii) dominance.

6 State **two** applications of Genetics other than Genetic Counselling and Engineering. (2 marks)

7 (a) Explain the following terms: (2 marks)

(i) niche; .....

(ii) carrying capacity. .....

(b) Describe the origin of life by special creation. (2 marks)

8 Describe the structure of a sensory neurone. (3 marks)

9 (a) State **one** survival value of geotropism to plants. (1 mark)

(b) State **two** functions of auxins. (2 marks)

10 State the importance of support and movement in plants. (3 marks)

(i) .....

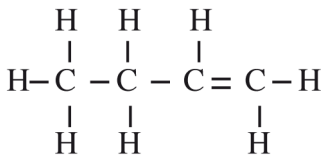
(ii) .....

(iii) .....

SECTION B: CHEMISTRY (33 marks)

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

11 (a) Name the compound whose structure is given below. (1 mark)



(b) Name **two** reagents that can be used to distinguish between alkanes and alkenes.
(1 mark)

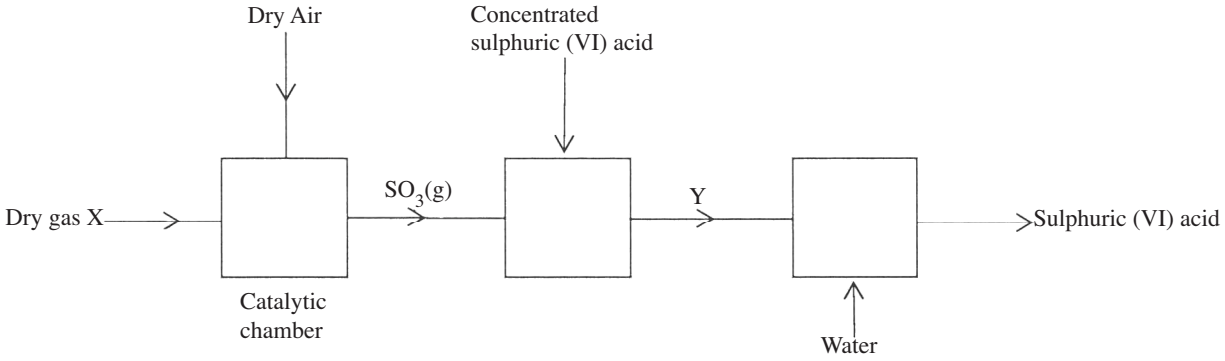
(c) State **two** uses of alkenes.
(2 marks)

12 (a) Name **two** common ores of iron. (1 mark)

(b) Describe the reduction process in extraction of iron metal from its chief ore.
(3 marks)

(c) State any **one** use of wrought iron. (1 mark)

13 The flow chart below shows part of the process for manufacturing sulphuric (VI) acid.



(a) Identify:

(i) X; .....

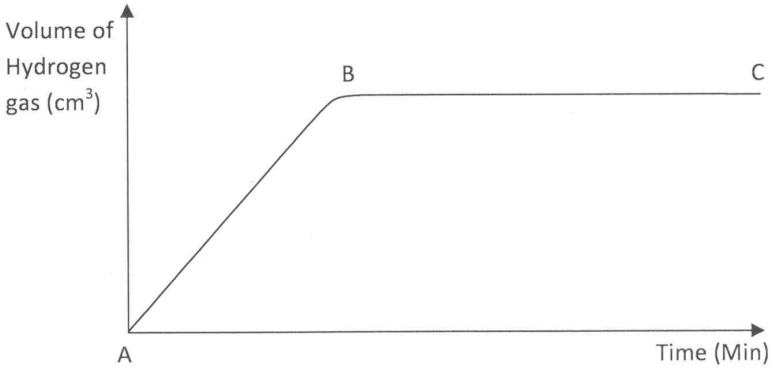
(ii) Y .....

(1 mark)

(b) Name the catalyst used in the catalytic chamber. (1 mark)

(c) Explain why sulphur(VI) oxide is first dissolved in concentrated sulphuric (VI) acid and not in water. (2 marks)

14 The graph below shows the rate of production of hydrogen gas when zinc granules are reacted with excess 2 M hydrochloric acid. The hydrogen gas produced was collected in a syringe.

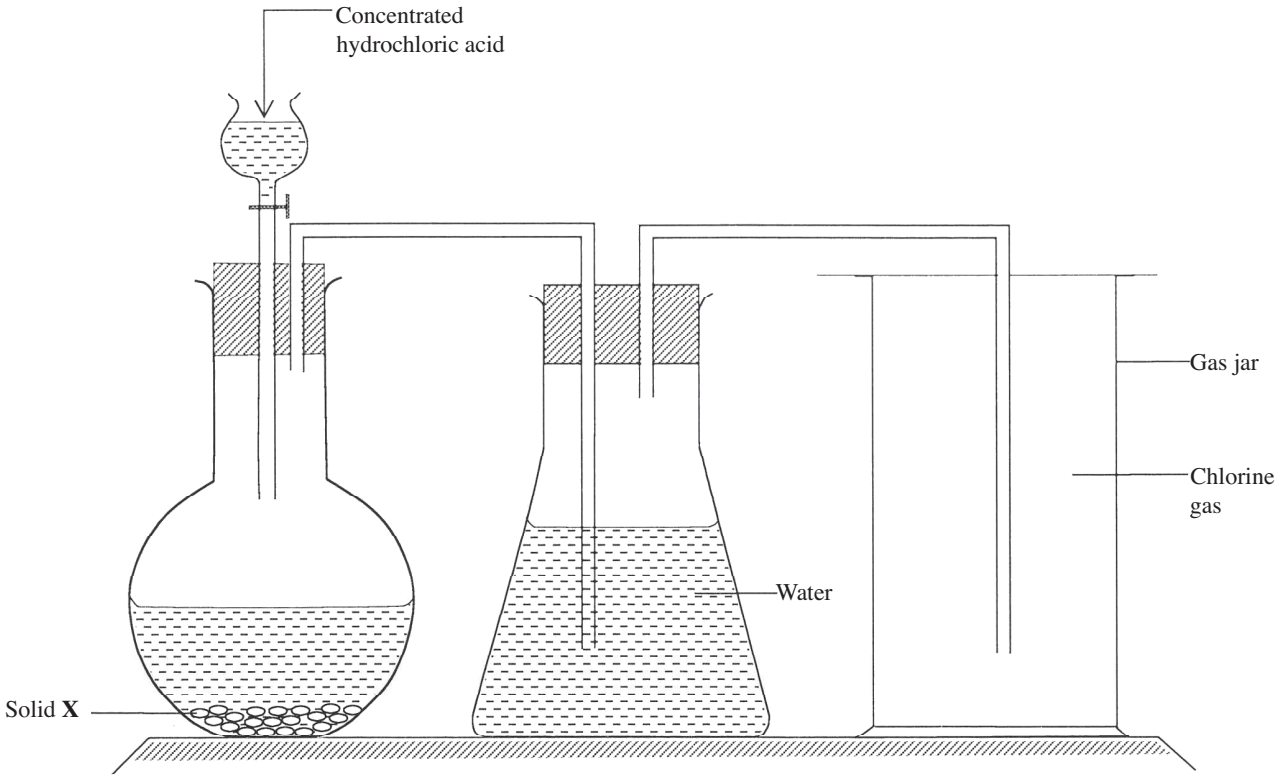


(a) Explain why part BC of the graph is horizontal. (2 marks)

(b) On the same axes, sketch the curve expected if zinc powder of the same amount as the zinc granules was used. (1 mark)

(c) What will be the effect of using excess 1 M hydrochloric acid instead of excess 2 M hydrochloric acid. (1 mark)

15 The set-up below was used to prepare chlorine gas. Use it to answer the questions that follow.

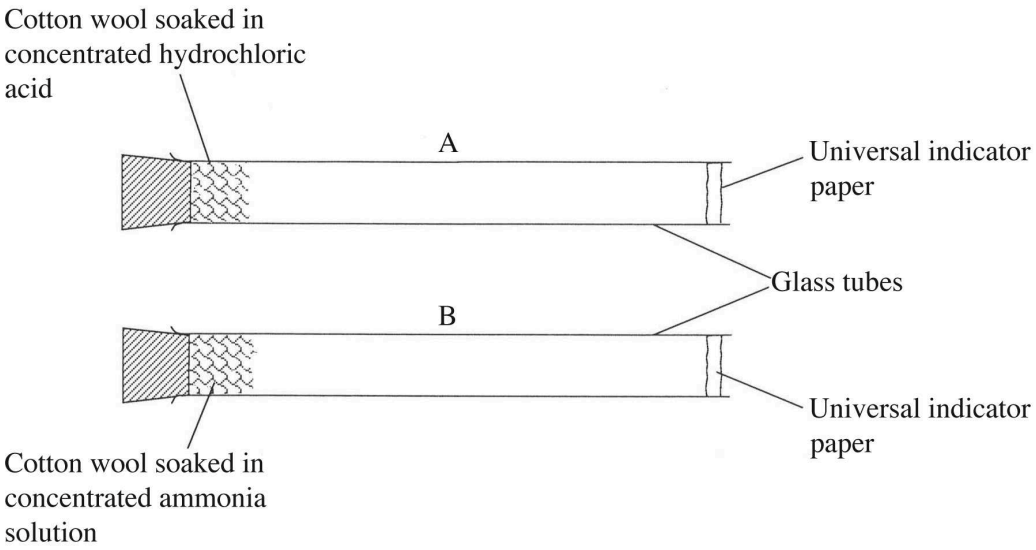


(a) Name solid X. (1 mark)

(b) Why was the chlorine gas produced in the set-up above passed through water before collection. (1 mark)

(c) State **two** observations made when a moistened blue litmus paper was introduced into the gas jar containing chlorine gas. (1 mark)

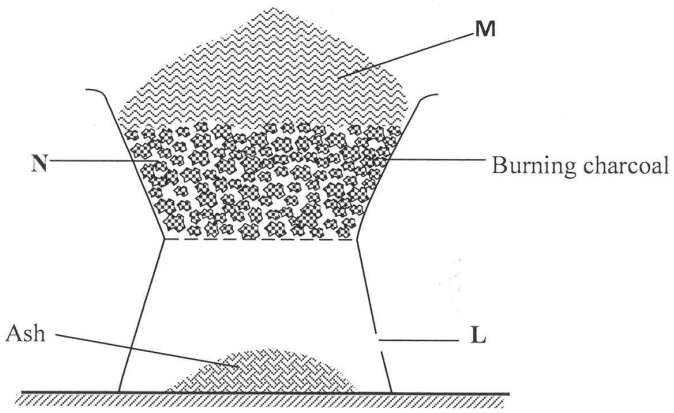
16 The set-up below was used to investigate the rates of diffusion of ammonia and hydrogen chloride gases. Pieces of cotton wool were soaked in concentrated solutions of hydrochloric acid and ammonia respectively, and inserted into the glass tubes A and B of the same size at the same time. (H = 1.0; Cl = 35.5; N = 14.0).



(a) In which tube did the universal indicator paper change first? Explain (2 marks)

(b) State the observations made in tubes A and B after some time. (1 mark)

17 The diagram below represents a Jiko (burner) with burning charcoal.



(a) (i) State **two** products formed in regions M and N. (1 mark)

M .....

N .....

(ii) What is the function of the part labelled L. (1 mark)

(b) Why should people be discouraged from using charcoal in Kenya? (1 mark)

(c) Give **two** advantages of using kerosene over charcoal as a fuel. (2 marks)

18 Given that 25 g of compound XCO_3 contains 0.25 moles, calculate the relative atomic mass of X. (C = 12.0; O = 16.0). (2 marks)

19 Describe how one can prepare one litre of 0.5 M magnesium nitrate solution. (Mg = 24.0; N = 14.0; O = 16.0). (3 marks)

SECTION C: PHYSICS (33 marks)

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

20 **Figure 1** shows two rays of light from a point O at the bottom of a beaker full of water. The rays are refracted into the air at the surface of the water.

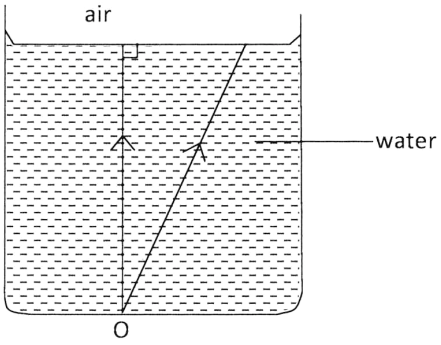


Figure 1

On the diagram, complete the path of the rays in air to show the position of the image O' of the point. (3 marks)

21 State the reason why it is not possible to charge a metal rod while holding it with a bare hand. (1 mark)

22 Explain why a naked flame should be avoided in an enclosed place, where an acid accumulator is being charged. (2 marks)

23 A student is given a magnet with its ends marked N and S. She is also given a metal bar with its ends marked A and B. Explain how the student can prove that the metal bar is a magnet. (1 mark)

24 (a) State what is meant by transverse waves. (1 mark)

(b) **Figure 2** shows how the displacement of a point varies with the time as a wave passes it.

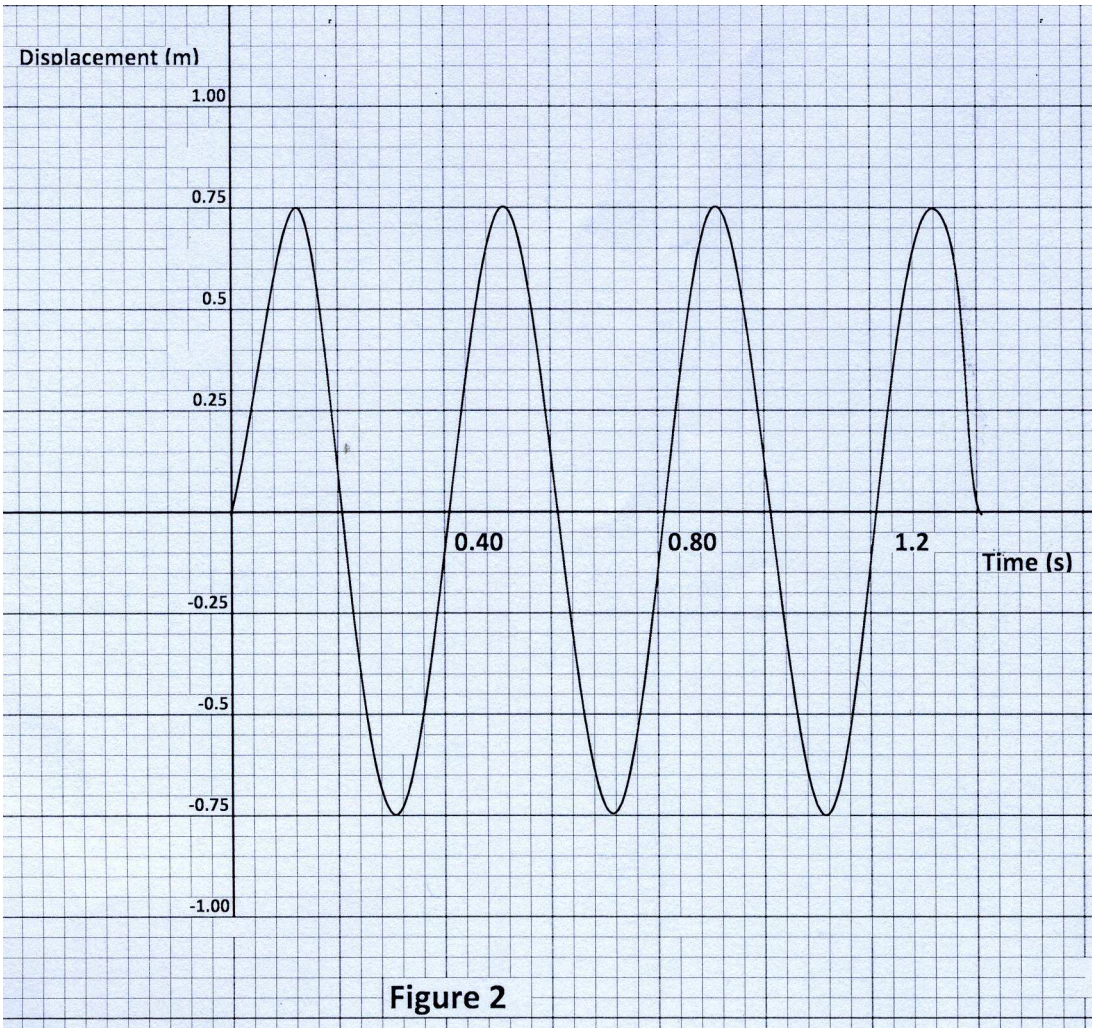


Figure 2

Determine:

(i) the amplitude. (1 mark)

(ii) the frequency of the wave. (1 mark)

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

26 (a) State the reason why, when measuring current through a resistor, the ammeter is always connected in series and not in parallel with the resistor. (1 mark)

(b) **Figure 3**, shows the scale of a voltmeter in a circuit. The scale of the voltmeter is in volts.

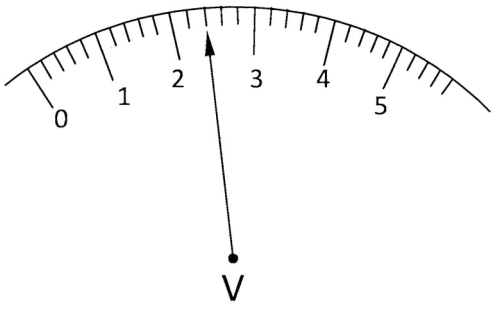


Figure 3

State the reading shown. (1 mark)

27 **Figure 4**, shows a circuit consisting of two different coils A and B connected in series with a battery and a switch. The coils are immersed in equal amounts of water in beakers P and Q.

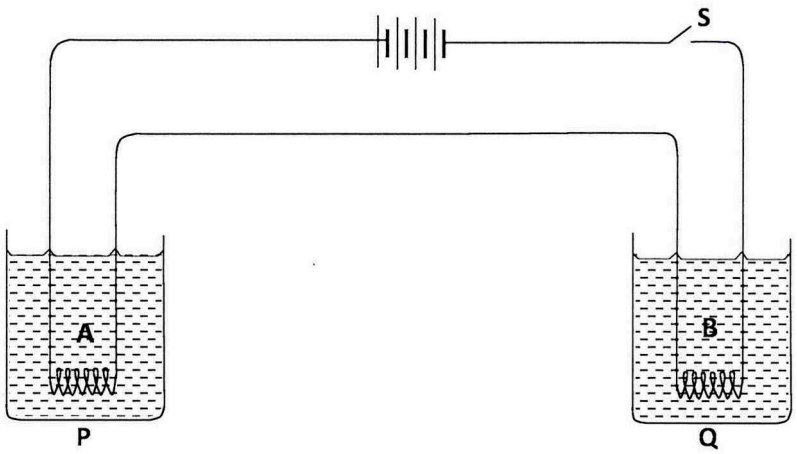


Figure 4

After switching on the circuit it is observed that water in Q boils before the water in P. State a reason for the observation. (1 mark)

28 **Figure 5** shows a periscope being used to observe a player over a wall.

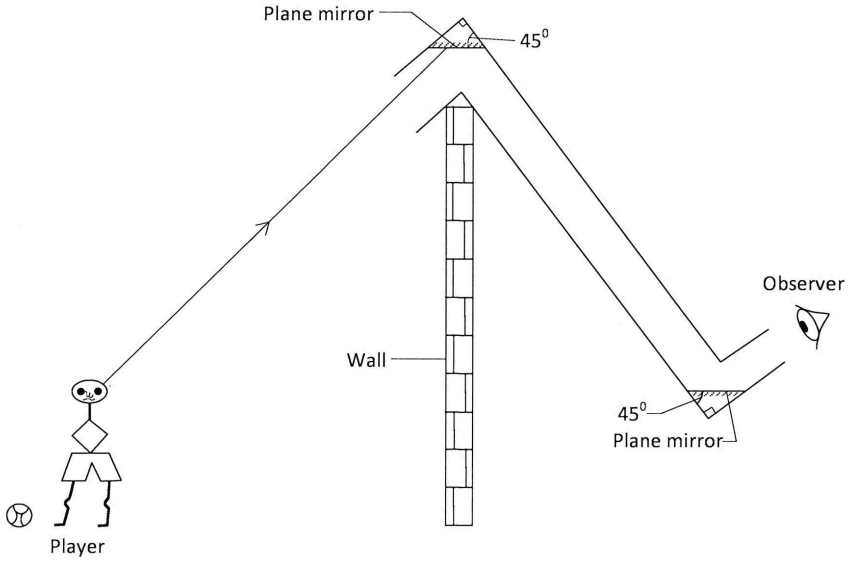


Figure 5

(a) Complete the diagram to show the path of the ray from the player to the observer. (1 mark)

(b) State the reason why the mirrors are placed at an angle of 45°. (1 mark)

29 **Figure 6** shows an object, O, placed infront of a diverging lens. F_1 and F_2 are the two principal foci of the lens.

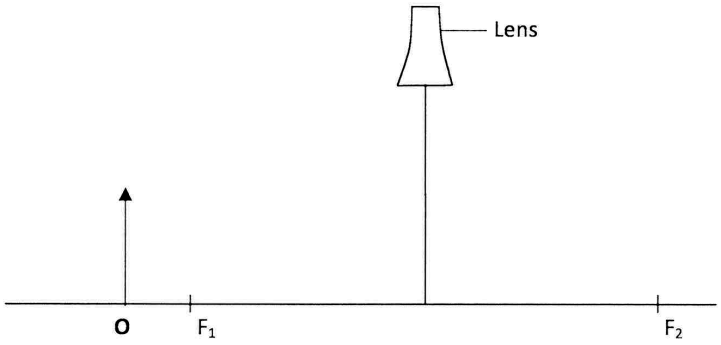


Figure 6

On the figure, draw a ray diagram to locate the image formed. (3 marks)

30 State **two** differences between hard X-rays and soft X-rays. (2 marks)

31 State **two** functions of the anode in the electron gun of a Cathode Ray Oscilloscope. (2 marks)

32 An electric bulb marked 75 W is used for 4 hours in a day. Determine the quantity of energy used in seven days in Kilowatt-hours. (3 marks)

33 Explain how pure silicon can be changed into a P-type semi-conductor by doping. (3 marks)

34 The mass of a 50 g radioactive material is found to have reduced to 6.25 g in 30 hours. Determine the half life of the material. (3 marks)