

4.7.2 General Science Paper 2 (237/2)

SECTION A : BIOLOGY

1. (a)

Disease	Causative Agent	Symptoms
Gonorrhoea	<i>Neisseria gonorrhoea</i> ;	Itching of urethra / yellowish discharge /pain when urinating / vaginal odour; (2 marks)
Candidiasis	<i>Candida albicans</i> ;	Itching and burning sensation of genital organs / white discharge from the vagina; (2 marks)

2. (a) (i) Ovary - produces eggs / ova ; and female hormones;

First one correct. (1 mark)

(ii) Uterus - where the embryo develops;
Contraction of the walls aids in the expulsion of the developed foetus during birth / parturition;

First one correct. (1 mark)

(iii) Cowper's gland - secretes an alkaline fluid that neutralizes the acidity along the urethra;

(1 mark)

(b) Attachment of the blastocyst to the walls of the uterus; by the villi.

(1 mark)

3. A - Pericarp fused with testa;

B - Position of plumule;

C - Position of radicle;

(3 marks)

4. (a) The fusion of nucleus of male gamete / sperm with the nucleus of female gamete / ovum; to form a zygote;

(2 marks)

(b) In a discontinuous growth, the organism shows a number of periods of rapid growth followed by long periods when no growth occurs; e.g. Growth shown by arthropods; (an example of an arthropod like locust, crab etc).

(2 marks)

5. (a) Variation - the differences in traits that occur among members of the same species;

(1 mark)

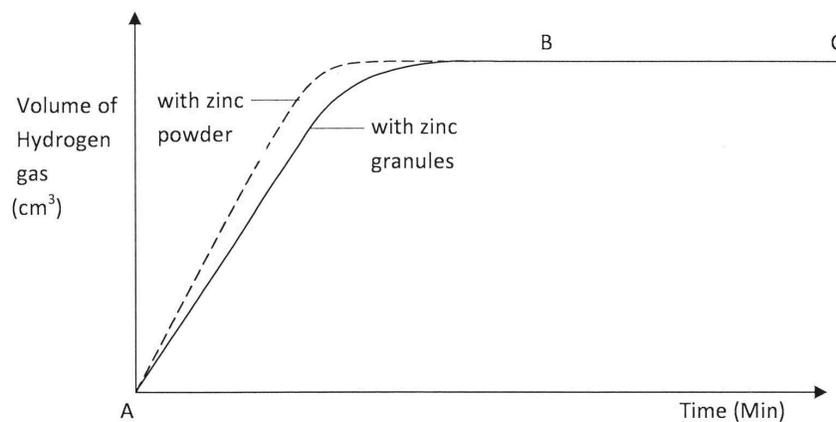
(b) (i) Haploidy - Chromosome numbers that are half of the full complement;

(1 mark)

- (ii) Genotype - refers to the genes that an organism contain / have for a particular trait. Genetic composition of an organism. (1 mark)
- (iii) Dominance - refers to the genes that determine the expression of the genetic trait in offspring;
State where genes express/supress other genes. (1 mark)
6. Blood transfusion; plant / animal breeding; crime detection, disputed parentage (2 marks)
7. (a) (i) Niche - the position that an organism occupies in a habitat / a functional description of a species role in a community / an expression of the range of all the factors that influence whether a species has all the resources it needs and whether it can carry out all the activities necessary for survival and reproducing; (1 mark)
- (ii) Carrying capacity - the maximum population / number of organisms of a particular speies that can be sustained by a given supply of resources; in an environment. (1 mark)
- (b) Special creation - life was brought into existence / created by a supreme being / God; life was created in perfect forms and have remained unchanged over time; (2 marks)
8. Sensory neurone - it has a cell body; situated off the axon.
Has receptor dendrites; located in the sensory organ.
Has long dendron and short axon;
Has myelin sheath; with nodes.
First three correct. (3 marks)
9. (a) Geotropism - roots move towards source of water;
Plants get anchored in the soil;
First one correct. (1 mark)
- (b) Auxins - promote / initiates growth; adventitious root development; causes apical dominance;
Prevent ageing / *senescence*;
Responsible for tropic movements;
First two correct. (2 marks)
10. Importance of support and movement in plants.
- At cellular level, like growth of pollen tube to bring about fertilization;
- At organ level such as tropic movements for survival value;
- Enable plants to get resources from the environment such as light / water nutrients;
- For escape to avoid harmful stimuli such as temperature;
- Bearing of leaves, fruits
First three correct. (3 marks)

SECTION B : CHEMISTRY (33 marks)

- 11.** (a) But-1-ene. $\surd(1)$ /butene (1 mark)
- (b) Bormine water. $\surd(1/2)$
Acidified potassium manganate (VII). $\surd(1/2)$ / KMnO_4 (1 mark)
- (c) Ripening of fruits.
Manufacture of plastics.
Manufacture of detergents
Manufacture of ethan-1, 2-diol
Manufacture of ethanol through hydrolysis
- (Any 2 correct.) (2 marks)
- 12.** (a) haematite $\surd(1/2)$
magnetite $\surd(1/2)$ (1 mark)
- (b) Coke in the furnace burns in the hot air to form carbon (IV) oxide $\surd(1)$.
Carbon (IV) oxide $\surd(1)$ rises to the middle of the furnance and reacts
with more coke to form carbon (II) oxide $\surd(1)$. Carbon (II) oxide/ coke reduces the
Iron (III) oxide to the Iron metal and carbon (IV) oxide. $\surd(1)$ (3 marks)
- (c) Making Agricultural implements, nails, sheets, ornaments and horse-shoes. (1 mark)
- (Any 1 correct.)
- 13.** (a) X - Dry Sulphur (IV) oxide / dry SO_2 $\surd(1/2)$ /sulphur dioxide
Y - Oleum $\surd(1/2)$ / $\text{H}_2\text{S}_2\text{O}_7$ (1 mark)
- (b) Vanadium (V) oxide / Vanadium Pentoxide $\surd(1)$
or Platinum/platinised asbestos. (1 mark)
- (c) Dissolving SO_3 in water is an exothermic reaction $\surd(1)$ that makes the acid to
vaporise $\surd(1)$. (2 marks)
- 14.** (a) The reaction is over $\surd(1)$ since all the zinc $\surd(1)$ granules have been used up. (2 marks)
- (b) On the graph $\surd(1)$ (1 mark)



½ mark for rise in volume
 ½ mark for flattening at the same level

- (c) The rate of reaction will be $\sqrt{(1)}$ slower. (1 mark)
- 15.** (a) Potassium manganate (VII)/ CaOCl_2 $\sqrt{(1)}$ (1 mark)
- (b) To remove the more soluble fumes of hydrogen $\sqrt{(1)}$ chloride gas produced by the acid. (1 mark)
- (c) The moist blue litmus paper turns red. $\sqrt{(1/2)}$
- The red litmus paper is then bleached. $\sqrt{(1/2)}$ (1 mark)
- 16.** (a) B / NH_3 $\sqrt{(1)}$
- Ammonia gas (RMM 17) is less dense $\sqrt{(1/2)}$ than hydrogen chloride gas/hydrochloric acid gas (RMM = 36.5) and hence diffused faster. $\sqrt{(1/2)}$ (2 marks)
- (b) In glass tube A, the universal indicator turned Red, $\sqrt{(1/2)}$ while in glass tube B, the universal indicator turned green. $\sqrt{(1/2)}$ (1 mark)
- 17.** (a) (i) M: Carbon (IV) oxide (CO_2) $\sqrt{(1/2)}$, N: Carbon (II) oxide (CO) $\sqrt{(1/2)}$. (1 mark)
 @ $\frac{1}{2}$ mark
- (ii) To allow in air. $\sqrt{(1)}$ (1 mark)
- (b) It brings about deforestation. $\sqrt{(1)}$
 global warming / Green house effect (1 mark)
- (Any 1 correct.)
- (c) - Easier to store $\sqrt{(1)}$ /it is less bulky
 - Amount of energy produced per unit amount is higher in kerosene than charcoal. $\sqrt{(1)}$ i.e. Kerosene has high heating value than charcoal.

- It is a cleaner fuel compared to charcoal.
(any 2 correct)

(2 marks)

18.

$$RFM = \frac{\text{mass}(g)}{\text{No. of moles}}$$

$$RFM = \frac{25}{0.25} \quad \checkmark(1/2)$$

$$= 100 \quad \checkmark(1/2)$$

$$x + 60 = 100 \quad \checkmark(1/2)$$

$$x = 40 \quad \checkmark(1/2)$$

(2 marks)

19.

$$RFM \text{ of } Mg(NO_3)_2 = 148 \quad \checkmark(1/2)$$

$$0.5 \text{ mole of } Mg(NO_3)_2 = 0.5 \times 148$$

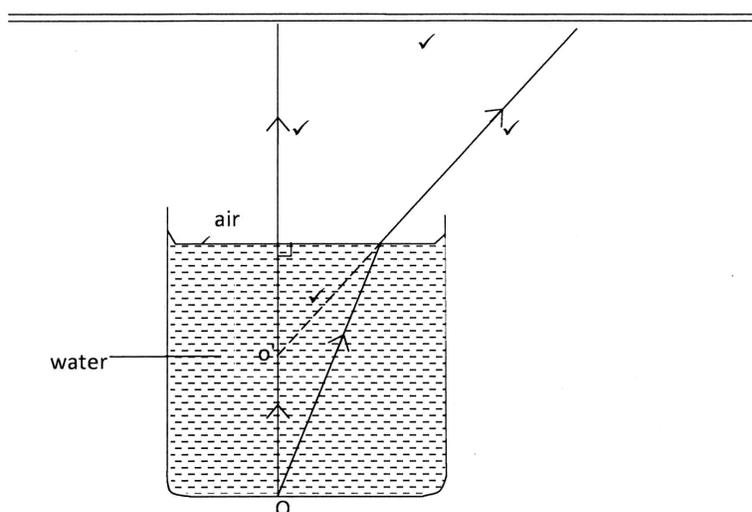
$$= 74 \text{ g} \quad \checkmark(1/2)$$

Weigh 74 g of magnesium nitrate and place it in 500 cm³ beaker. $\checkmark(1/2)$ Add about 400 cm³ of distilled water and stir to dissolve Mg(NO₃)₂. $\checkmark(1/2)$ Transfer solution to a litre volumetric flask $\checkmark(1/2)$. Rinse beaker and pour the solution into the volumetric flask. Top up the remaining volume with distilled water upto the mark. $\checkmark(1/2)$

(3 marks)

SECTION C : PHYSICS

20.



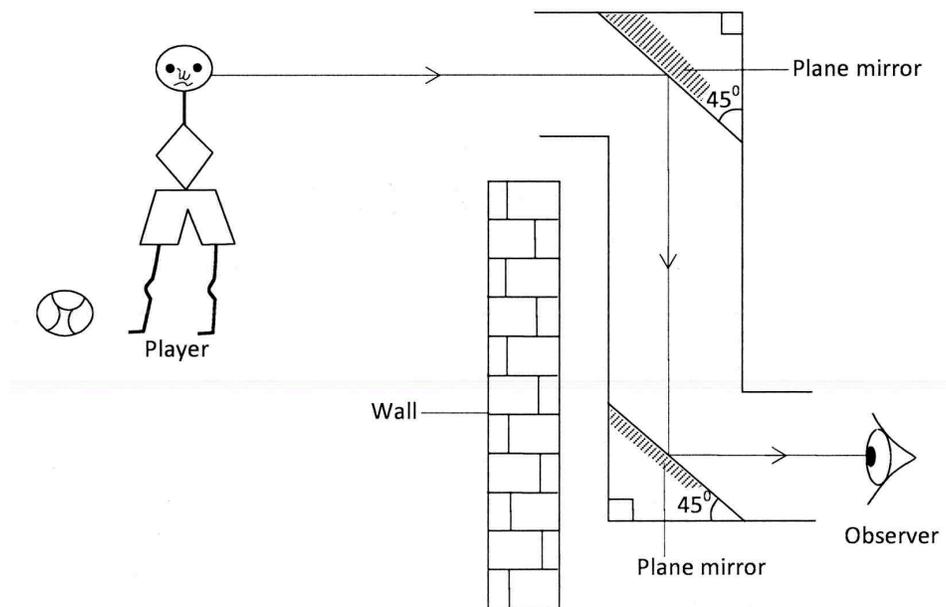
21. Any acquired charge flows through the body. \checkmark

22. During charging process both Oxygen and hydrogen gas are given off. ✓
The two can become explosive if exposed to a naked flame. ✓
23. The bar is a magnet if any of ✓ it ends is repelled by the magnet North or South poles. ✓
24. (a) Waves in which the vibration of the particles is always perpendicular to the direction of the wave travel. ✓
- (b) (i) - 0.75 m
- (ii) $f = \frac{1}{T}$
- $$\frac{1}{0.4} = 2.5 \text{ Hz.}$$
25. - Density ✓
- Pressure ✓
- Humidity/temperature

(any 2 correct)

26. (a) All the current passing through resistor passes through the ammeter.
- (b) 2.4 V
27. Coil B has higher resistance than A.

28. (a) (i)



- (b) The ray successively passes through the tube (Ray is parallel to the walls of the tube). ✓

29.

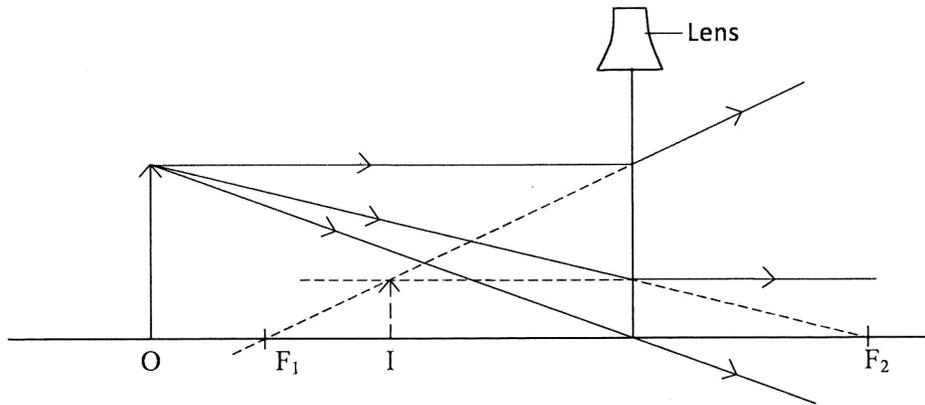


Figure 6

30. Hard x-rays have higher penetration power than soft x-ray. ✓

Hard x-rays are produced at higher accelerating voltage than soft x-ray. ✓

Hard x-rays have shorter wave length than soft x-rays. ✓

(any correct two)

31. - Accelerating the electrons. ✓

- Focusing the electrons into a fine beam. ✓

32. $E = Pt$ ✓

$$= \frac{75}{1000} \times 4 \times 7 \quad \checkmark$$

$$= 2.1 \text{ Kilowatt - hours} \quad \checkmark$$

33. Pure silicon is doped with a trivalent element. ✓ This results in the three valency electrons of the impurity pairing with electrons of silicon ✓ and thus leaving a hole in the structure. ✓

34. $50\text{g} \rightarrow 25\text{g} \rightarrow 12.5\text{g} \rightarrow 6.5\text{g}$ ✓

Three half lifes = 30 hrs ✓

Half-life = 10 hrs ✓