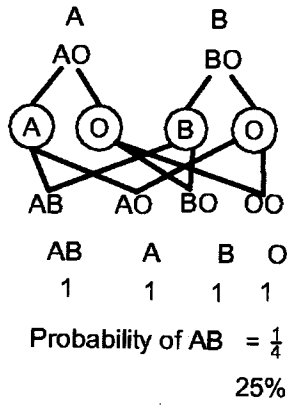
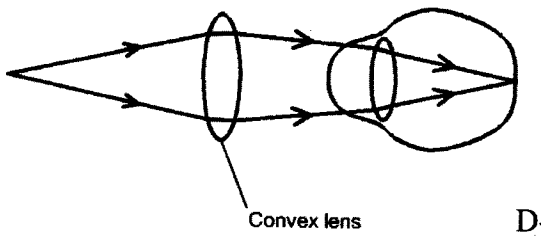
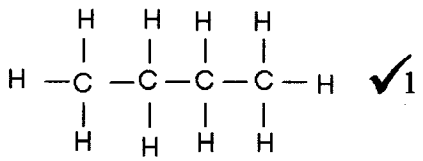
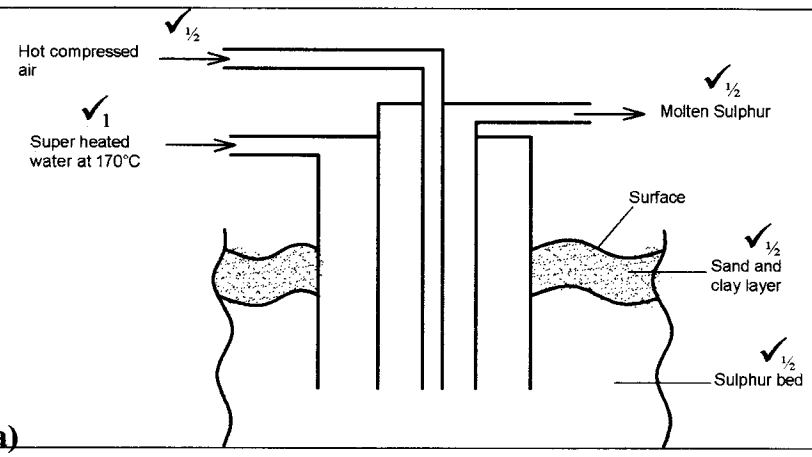
5.6.2 General Science Paper 2 (237/2)

SECTION A: BIOLOGY (34 marks)

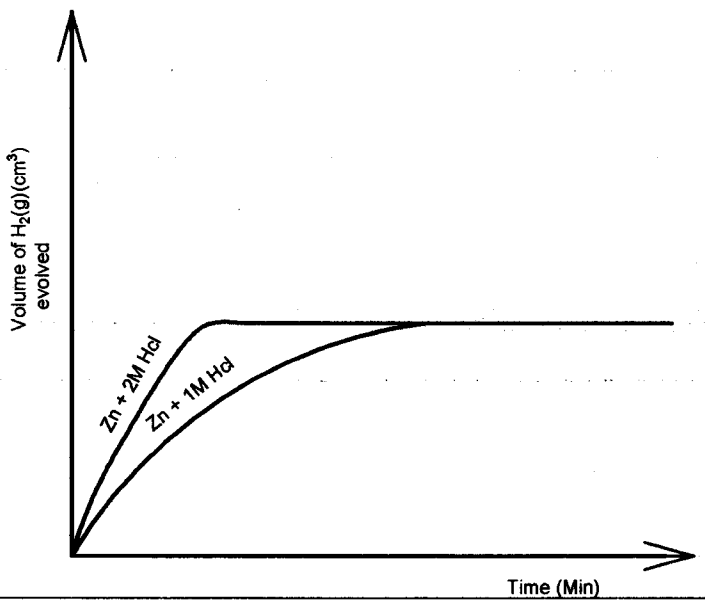
1.	a) - Leaves modified into thorns/are needle like to reduce evapotranspiration; - Succulent stems to store water; - Deep rooted to absorb water from deep horizons; - Few stomata to reduce transpiration; - Sunken stomata to reduce rate of transpiration; - Have waxy cuticle to reduce rate of respiration; 3x1	(3 marks)
	b) - Suffocation of aquatic animals due to reduced dissolved oxygen levels; - Rapid growth of aquatic weeds; - Disease agents in sewage contaminated water; - Toxic chemicals in sewage kill aquatic organisms; - Accumulation of heavy metals causing blood poisoning, nervous problems and death; **- Rj pollutes the water alone.** 3x1	(3 marks)
2	a) The production of an offspring as a result of the fusion of a male and a female gamete; 1x1	(1 mark)
	b) Is the duration between fertilization and birth; 1x1	(1mark)
3.	a) Progesterone; **RJ wrong spelling.** b) Repair and healing of the endometrium/ uterine wall; c) Luteinising hormone (L.H); **Rj abbreviations** d) Sperms/ova remain viable in the female reproductive system for 2-3 days;	(1 mark) (1 mark) (1 mark) (1 mark)
4.	a) Epigeal germination; **RJ wrong spelling.** b) Due to faster elongation of the hypocotyl than the epicotyl the cotyledons and plumule are pushed above the ground; c) Protects the plumule/Photosynthesis; d) Exposure of the hypocotyl to light makes auxins to migrate to the lower side; Higher concentration of auxins on the lower side makes the lower sides to grow faster enabling the seedling to straighten; 2x1	(1 mark) (1 mark) (1 mark) (2 marks)
5.	Man/male has X and Y sex chromosomes while woman/female has X chromosomes only; Fusion of X and Y chromosomes produces a male child; while X and X produces a female child; 3 x 1	(3 marks)

6.	(a) Blood group A. **Rj AO;AA** (b) Blood groups  AB A B O 1 1 1 1 Probability of AB = $\frac{1}{4}$ 25% F_1 Genotypes AB A0 B0 00 F_1 Blood groups AB A B 0; 1 1 1 1 Probability of AB = ¼ / 25%; **Rj 0.25** 2x1	(1 mark) (2 marks)
7.	(a) Hydrotropism; **Rj wrong spelling. Acc. Positive hydrotrphism.** (b) Enables plant roots to seek for water; (c) On sensing moisture, the auxins migrate to the side with moisture where they inhibit the rate of growth; side away from moisture grows at a higher rate making the root to curve towards the direction of water;	(1 mark) (1 mark) (1 mark)
8.	(a) Long sightedness (hypermetropia). **Acc long sighted.** (b)  D-1 L-1	(1 mark) (2 mark)
9.	(a) Analogous structures (b) Tendrils in passion are modified axillary buds while in pea plant they are modified leaflets but they all carry out the function for providing mechanical support;	(1 mark) (1 mark)
10.	(a) H – Fibula; J – Tibia; (b) Hinge joint;	(1 mark) (1 mark) (1 mark)

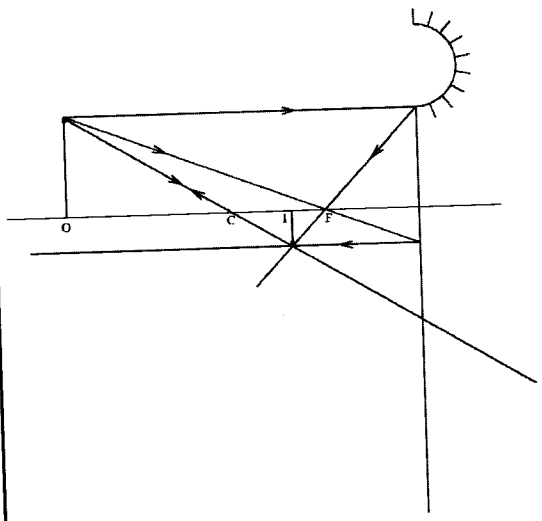
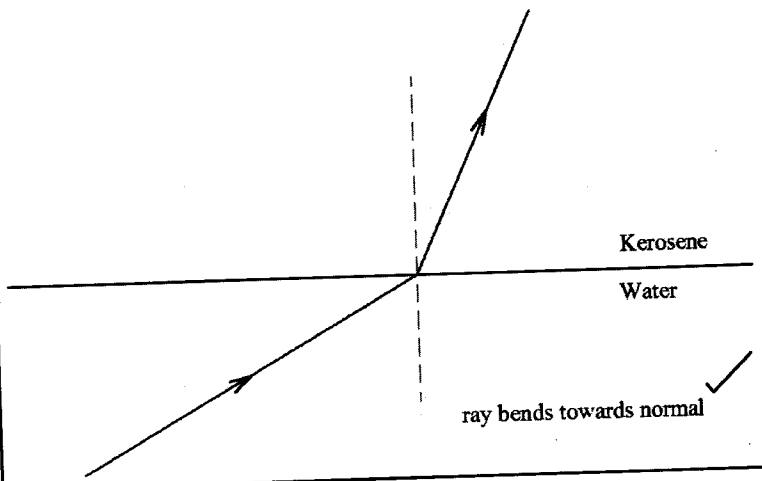
SECTION B - CHEMISTRY

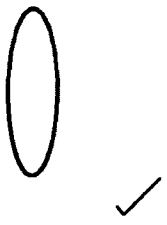
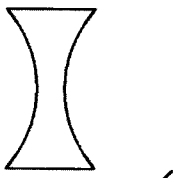
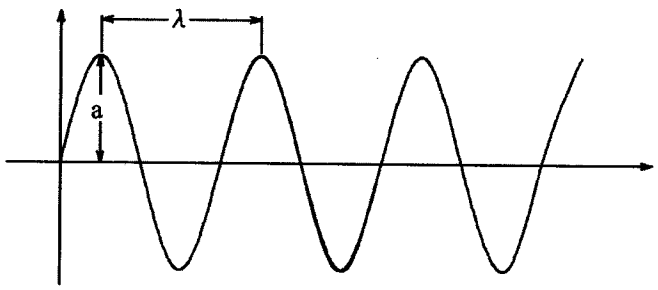
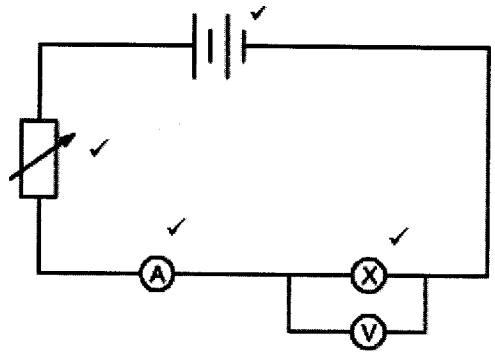
11.	(a)  ✓1	(1 mark)
	b) manufacture of margarine from oil or manufacture of fats from oils/ Conversion of oils into fats	(1 mark) (2 marks)
12.	(a) $3CuO_{(s)} + 2NH_{3(g)} \rightarrow 3Cu_{(s)} + 3H_2O_{(l)} + N_{2(g)}$ (b) reducing agent	(1 mark) (1 mark) **2 marks**
13.	a) A mole refers to the amount of a substance that contains as many particles as carbon – 12 or The amount of a substance that contains Avogadro's number of particles. The particles could be atoms, molecules, ions, electrons etc	(1 mark)
	b) $P_2V_2 = P_1V_1$ $\Rightarrow p_2 = \frac{p_1 v_1}{v_2}$ $= \frac{760x300}{800}$ $= 285mmHg$	**(1 mark)** **(1 mark)**
14.	 a)	**(3 marks)**

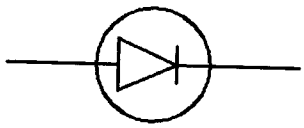
	b(i) Concentrated sulphuric (VI) acid is hygroscopic hence absorbs water from the atmosphere thereby increasing the volume (ii) Used as a drying agent	**(1 mark)** **(1 mark)**
15.	(a) The equilibrium will shift to the right as more of the reactants are consumed to produce more RO_3 (b) The yield of RO_3 will decrease because increase in temperature will favour a reaction that absorbs the excess heat.	1 mark 1 mark **2 marks**
16.	a) (i) ΔH - Heat of solution (ii) Negative (-ve) b) This is because strong acids and strong bases are all fully dissociated/ionized c) - Ease of combustion - Availability - Environmental effects - High heat value	(1 mark) (1 mark) (1 mark) (1 mark) (1 mark) **(5 marks)**
17.	a) Polymer is a big molecule of high molecular mass formed from the reaction of the small molecules.	(1 mark)
	b) - making PVC pipes - Raincoats, handbags, hosepipes, floor tiles	(1 mark)
18.	a) (i) Electrolysis (ii) Reduction	(1 mark) (1 mark)
	b) (i)	(5 marks)
19.	a) Concentration refers to the amount of substance dissolved in a definite volume of solution	(1mark)

	b (i) No. of moles = $\frac{mass}{RFM}$ RFM of NaOH $= 23 + 16 + 1$ $= 40$ $= \frac{28}{40}$ $= 0.7$	(½ marks) 1 mark (½ marks)
	b(ii) $0.7 moles \rightarrow 2 litres$ $? \rightarrow 1 litre$ $\frac{1}{2} \times 0.7 (\frac{1}{2} mark) = 0.35M (\frac{1}{2} mark)$	
	(iii) $1 mole \rightarrow 40g$ $\quad 28g \rightarrow 2l$ $0.35 moles \rightarrow ?$ or $? \rightarrow 1l$ $\frac{0.35}{1} \times 40$ (½) $\quad = \frac{1}{2} \times 28$ $= 14g/1$ (½) $\quad = 14g/1$	5 marks
20.	a) The rate of hydrogen production doubles/ increases	(1 mark)
	b)  	(2 marks)

SECTION C- PHYSICS

21.	(a) Virtual ✓ Upright ✓ Inverted Same size as object **(Any two correct)**	(2 marks)
	(b)  Any two correct rays ✓ 2 Correct position of object(beyond C) ✓	(3 marks)
22.	 ✓	(1 mark)
23.	(a) Y is positively charged. ✓ X is negatively charged.	(1 mark)
	(b) - Both hair and comb get charged by rubbing. ✓ - Hair attracts air ions of opposite charge and a spark is formed as hair is discharged. ✓	(2 marks)

24.	(a)  Convex lens ✓	(1 mark)
	(b)  Concave lens ✓	(1 mark)
25	 λ ✓ a ✓	(2 marks)
26.	(a) An echo is a second sound heard after the actual (first) sound is reflected from ✓ a barrier./ Reflected sound	(1 marks)
	(b) Wind may increase the speed of sound if in the same direction as the sound. ✓ or reduce the speed of sound if in the opposite direction. ✓	(2 marks)
27.	(a) It aligns itself with the earth's magnetic field. ✓	(1 mark)
	(b) Removal of small pieces of iron from a patient's eye. ✓/electric bells for emergencies	(1 mark)
28.	 ✓ ✓ ✓ ✓	(4 marks)
29.	- The amount of water. ✓ - The power rating of the heater. ✓/amount of current/voltage/resistance/ amount of heat - Pressure of the surrounding.	(2 marks)

30.	$20 \rightarrow 10 \rightarrow 5$ 2 half lifes in 48 hours ✓ OR $\therefore$ half-life $= \frac{48}{2}$ $= 24$ hours ✓ $N = N_0(^1/_2)^t_{1/2}$ $5 = 20(^1/_2)^t_{1/2}$ $t_{1/2} = 24$ hours	(2 marks)
31.	(a) The process of adding impurities to a semiconductor in order to increase its conductivity. ✓	(1 mark)
	(b)  ✓	(1 mark)
32.	(a) - Carry negative charge. ✓ - Deflected by both magnetic and electric fields. ✓ - Move in straight lines. - Affect photographic plates. - Cause fluorescence.	(2 marks)
	(b) - X-ray photography ✓ - Sterilize equipment - Detect flaws in metals **(any one)**	(1 mark)
33.	- to minimize cost of electricity/ wastage of power ✓ - for bulbs to last longer **(any one)**	(1 mark)