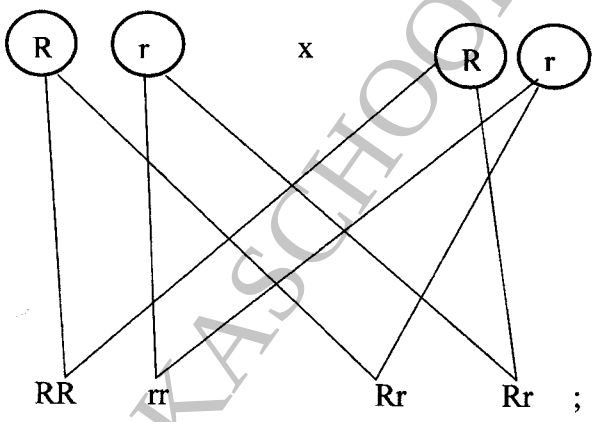
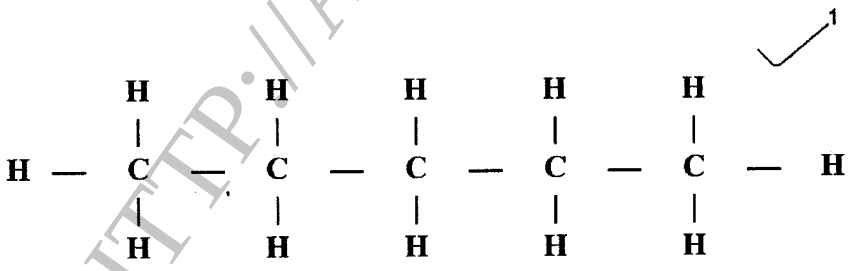
4.8.2 General Science Paper 2 (237/2)

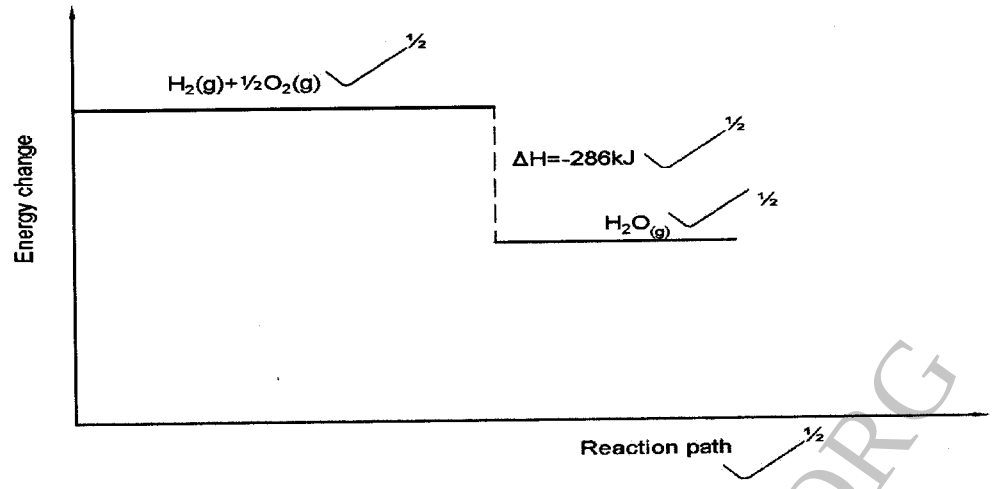
SECTION A: BIOLOGY

1. (a)	(i) E – Roundworms/*Ascaris spp*; F – *Plasmodium ovale*/*Plasmodium vivax*; (ii) Human beings;	(1 mark) (1 mark) (1 mark)
(b)	– Thick and hard protective covering/pellicle to resist digestion by enzymes; – Covered by mucus to resist digestion by the host enzymes; – Can respire anaerobically to survive in the oxygen-deficient intestines; – Eggs are enclosed/covered by hard shells to resist digestion in the intestines and harsh external environment; – Has two hosts to increase survival chances; **3 x 1**	(3 marks)
2.	Similar cell organelles/and (some) biological molecules; are found in the cells of almost all living organisms; suggesting that the organisms had a common ancestry/phylogenically related; **3 x 1**	(3 marks)
3. (a)	(i) Femur; (ii) Tibia;	(1 mark) (1 mark)
(b)	Hinge joint;	(1 mark)
4. (a)	J – Vas deferens/sperm duct; K – Epididymis;	(1 mark) (1 mark)
(b)	J – Conveys sperms from the epididymis to the urethra during ejaculation; K – Storage of mature sperms;	(1 mark) (1 mark)
5.	- Head has acrosome which produces hydrolytic enzyme that digests the vitelline wall of the ovum during fertilization; - Head has a nucleus which contains genetic materials that determine the characteristics/traits of the offspring;	(3 marks)

	- Middle part has numerous mitochondria to provide sufficient energy required for swimming; towards the ovum; - Has a long tail for propulsion/swimming towards the ovum; **3 x 1**	
6. (a)	(i) White flower gene; (ii) Red and white flowered plants are produced in the ratio of 3:1;	(1 mark) (1 mark)
(b)	Red – Rr, Rr;	(1 mark)
(c)	Parental genotypes: Rr Rr ; Parental phenotype: Red-flowered Red-flowered Gametes Crossing  ; F_1 genotypes RR rr Rr Rr ; **3 x 1**	(3 marks)
7. (a)	Slow growth rate; because the exoskeleton has hardened and is limiting growth;	(2 marks)
(b)	Rapid growth occurs after moulting; before the exoskeleton hardens;	(2 marks)
8. (a)	Cochlea;	(1 mark)
(b)	Vestibular apparatus;	
c)	- Hereditary abnormalities in the ear; - Injury to the brain/auditory nerve/cochlea; - Damage (mechanical/physical) of the eardrum; - Ear infections; **3 x 1**	(3 marks)

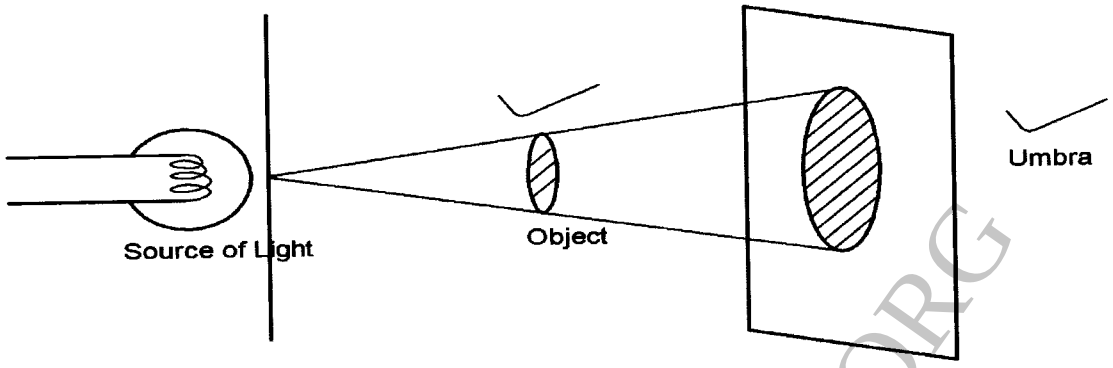
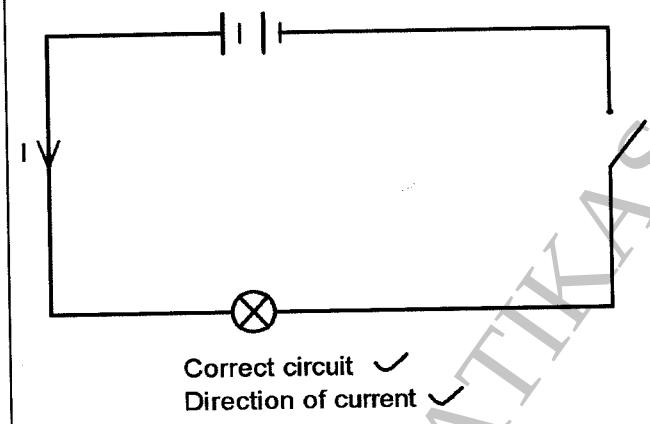
SECTION B: CHEMISTRY

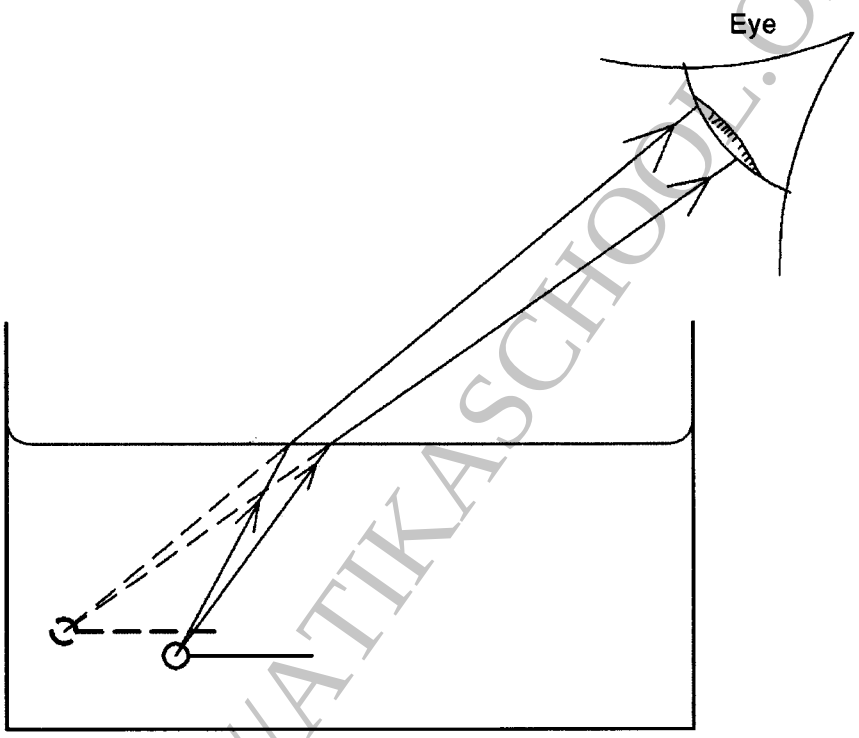
9.	a) Boyle's Law -A volume of a fixed mass of a gas is inversely proportional to its pressure provided the temperature remains constant. ✓1	(1 mark)
	b) $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$ $V_2 = \left(\frac{740 \times 225 \times 286}{603 \times 780}\right)$ ✓1 $= 101.24\ cm^3$ ✓1	(2 marks)
10.	a) A solution that contains one mole of a substance in $1dm^3$/ 1000 cm^3 of solution.	(1 mark)
	b) Dilution formular $C_1V_1 = C_2V_2$ $V_2 = \frac{C_1V_1 =}{C_2}\left(\frac{15 \times 3}{1}\right) = 45cm^3$ ✓1 Amount of water added = 45 – 15 = $30cm^3$ ✓1	(2 marks)
11.	a) 	(1 mark)
	b) Pentane	(1 mark)
12.	a) A reaction where heat is absorbed from the surrounding.	(1 mark)

	b)  	(2 marks)
13.	a) Cellulose, rubber, cotton, carbohydrate, protein, silk (Any 2 correct @ $^1/_2$ mark)	(1 mark)
	b) Manufacture of clothing/fibres Manufacture of tyres (Any 2 correct @ $^1/_2$ mark)	(1 mark)
14.	– Deforestation/ cutting down trees. ✓1 – Produces Carbon(IV) oxide which causes global warming. ✓1	(2 marks)
15.	R. Formula $Ca(HCO_3)_2$ ✓½ R.F.M. = (40+2+24+96) = 162 ✓½ Mass of $Ca(HCO_3)_2$= (0.35 ×162) ✓½ = 56.7g ✓½	(2 marks)
16.	a) Curve i ✓1 -The gradient for curve (i) is steeper hence the reaction is faster implying the concentration is higher ✓1	(2 marks)
	b) - Temperature; - Surface area of solid reactants; - Catalyst - Concentration. (Any 2 correct @ 1 mark)	(2 marks)

17.	a) Na^+, Cl^- **Penalize** if written in words	(1 mark)
	b) Sodium is more reactive than carbon and the ore is not an oxide	(1 mark)
	c) - Coolant in nuclear reactions; - Sodium lamp; - Extraction of gold. - Extraction of titanium (Any 2 correct@$^1/_2$ mark)	(1mark)
18.	a) Oleum	(1 mark)
	b) $SO_{2(g)} + H_2SO_{4(l)} \rightarrow H_2S_2O_{7(l)}$	(1 mark)
	c) The sugar turned brown then a black mass is formed because conc. H_2SO_4 dehydrates /removes the elements of water from sugar.	(1 mark)
19.	a) - Silica; -iron(II) oxide.	(1 mark)
	b) - Aluminium is a better conductor of heat. - Aluminium does not corrode easily because it forms a layer of insoluble oxide.	(1 mark)
20.	a) (i) Solution **A** - dilute hydrochloric acid; (ii) Gas **B** –sulphur(IV) oxide.	(1 mark) (1 mark)
	b) Gas **B** is denser/ heavier than air	(1 mark)
	c) - Manufacture of sulphuric(VI) acid; - Bleaching agent; - Fumigating houses; - Preservative (Any 2 correct @ 1 mark)	(1 mark)

SECTION C: PHYSICS

21.	a)  Rays – (1 mark) Shadow – (1 mark)	(2 marks)
	b) The shadow formed would have two regions. A full shadow and a partial shadow.	(1 mark)
22.	 	(2 marks)
23.	a) A pulse is a single disturbance that moves through a medium from one point to another.	(1mark)
	b) The distance between two successive crests (or troughs) **Or** The distance between two successive points in a wave that are in phase.	(1mark)

24.	Repulsion takes place only between like poles of a magnet while attraction can occur between unlike poles of magnets or between a magnet and any magnetic material.	(2 mark)
25.	On rubbing the glass loses some electrons to the cloth, it therefore gets a net positive charge.	(2 mark)
26.	When sound from a source is reflected by a barrier and reverses direction. Reflected sound (echo) is received by observer.	(2 mark)
27.	a) Ammeter/millimeter/micro ammeter	(1 mark)
	b) Current = 1.7 A	(1 mark)
28.		(3 mark)
29.	Electrical energy(electric field) → Kinetic energy (of electrons) → heat and x-rays	(3 mark)

30.	Energy consumed = $\frac{4\times75\times6\times30}{1000}kWh$ = 54 kW Cost = 54×9.30 = Ksh. 502.20	(3 mark)
31.	– Carries a positive charge. – Can ionize gas/air strongly – It is equivalent to helium ion – Can be stopped by a thick sheet of paper – Is deflected by both electric and magnetic fields (Any two correct)	(2 mark)
32.	– Can measure both alternating and direct voltages – Responds instantaneously unlike ordinary meter – Does not affect the circuit due to its high resistance – Can measure large voltages without getting damaged. **(Any three @1 mark)**	(3 marks)
33.	Raise temperature/by doping	(1 mark)
34.	– Virtual – Diminished	(2 mark)
35.	Electrical kettle/electric iron/filament lamps/soldering gun/electric heater **(1 mark for any one correct)**	(1 mark)