

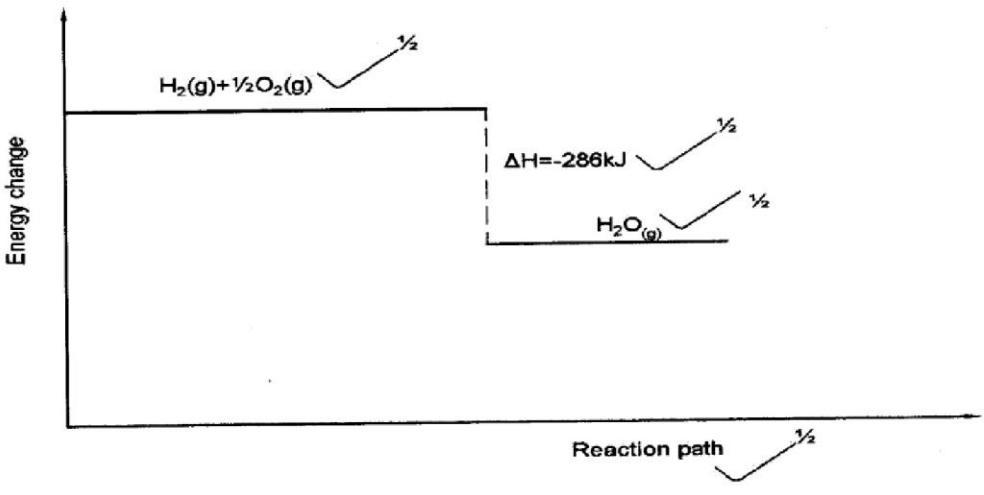
SECTION A: BIOLOGY

1. (a)	(i) E – Roundworms/ <i>Ascaris spp</i> ; F – <i>Plasmodium ovale</i> / <i>Plasmodium vivax</i> ;	(1 mark) (1 mark)
	(ii) Human beings;	(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;	(1 mark)
	(ii) Tibia;	(1 mark)
(b)	Hinge joint;	(1 mark)
4. (a)	J – Vas deferens/sperm duct;	(1 mark)
	K – Epididymis;	(1 mark)
(b)	J – Conveys sperms from the epididymis to the urethra during ejaculation;	(1 mark)
	K – Storage of mature sperms;	(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)

	<ul style="list-style-type: none"> - 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; <p style="text-align: right;">3 x 1</p>	
6. (a)	<p>(i) White flower gene;</p> <p>(ii) Red and white flowered plants are produced in the ratio of 3:1;</p>	(1 mark) (1 mark)
	(b) Red – Rr, Rr;	(1 mark)
	<p>(c) Parental genotypes: Rr Rr ;</p> <p>Parental phenotype: Red-flowered Red-flowered</p> <p>Gametes</p> <p>Crossing</p> <p>F₁ genotypes</p> <div style="text-align: center;"> <p style="text-align: right;">3 x 1</p> </div>	(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;	
	<p>(c)</p> <ul style="list-style-type: none"> - Hereditary abnormalities in the ear; - Injury to the brain/auditory nerve/cochlea; - Damage (mechanical/physical) of the eardrum; - Ear infections; <p style="text-align: right;">3 x 1</p>	(3 marks)

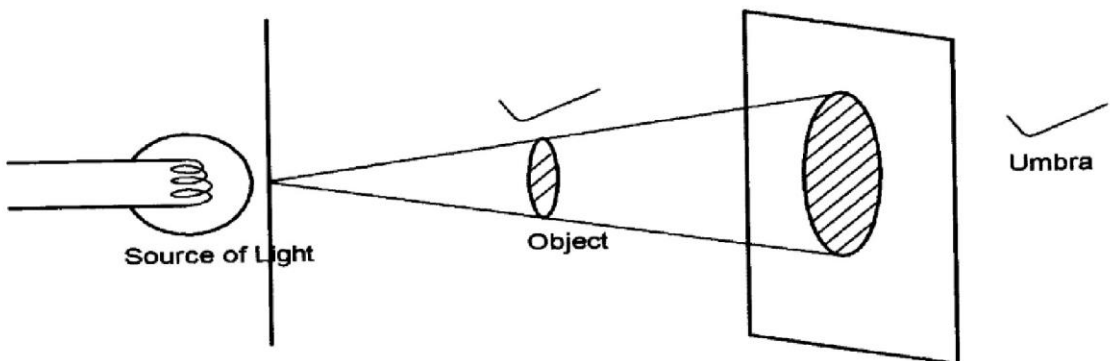
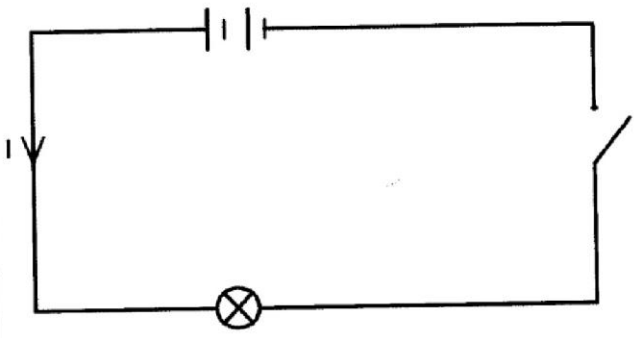
SECTION B: CHEMISTRY

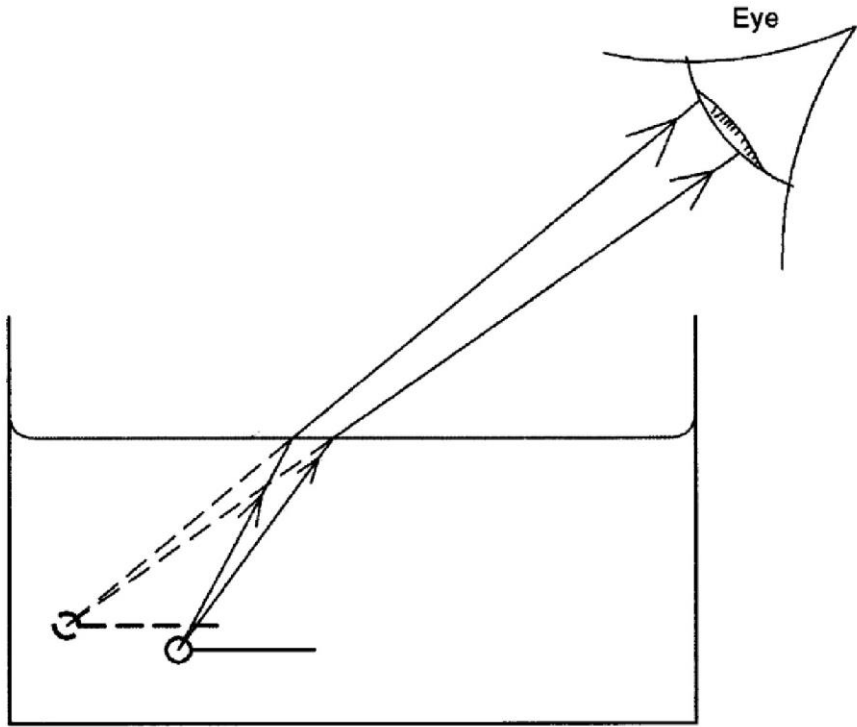
9.	<p>a) Boyle's Law -A volume of a fixed mass of a gas is inversely proportional to its pressure provided the temperature remains constant.</p> <p style="text-align: center;">✓1</p>	(1 mark)
	<p>b) $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$</p> $V_2 = \left(\frac{740 \times 225 \times 286}{603 \times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

	<p>b)</p> 	(2 marks)
13.	<p>a) Cellulose, rubber, cotton, carbohydrate, protein, silk (Any 2 correct @ 1/2 mark)</p>	(1 mark)
	<p>b) Manufacture of clothing/fibres Manufacture of tyres (Any 2 correct @ 1/2 mark)</p>	(1 mark)
14.	<p>- Deforestation/ cutting down trees. ✓₁ - Produces Carbon(IV) oxide which causes global warming. ✓₁</p>	(2 marks)
15.	<p>R. Formula $\text{Ca}(\text{HCO}_3)_2$ ✓_{1/2} R.F.M. = (40+2+24+96) = 162 ✓_{1/2} Mass of $\text{Ca}(\text{HCO}_3)_2 = (0.35 \times 162)$ ✓_{1/2} = 56.7g ✓_{1/2}</p>	(2 marks)
16.	<p>a) Curve i ✓₁ -The gradient for curve (i) is steeper hence the reaction is faster implying the concentration is higher ✓₁</p>	(2 marks)
	<p>b) - Temperature; - Surface area of solid reactants; - Catalyst - Concentration. (Any 2 correct @ 1 mark)</p>	(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 @ $\frac{1}{2}$ mark)	(1 mark)
18.	a) Oleum	(1 mark)
	b) $\text{SO}_{2(g)} + \text{H}_2\text{SO}_{4(l)} \rightarrow \text{H}_2\text{S}_2\text{O}_{7(l)}$	(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

<p>21. a)</p>	 <p>Source of Light</p> <p>Object</p> <p>Umbra</p> <p>Rays – (1 mark)</p> <p>Shadow – (1 mark)</p>	<p>(2 marks)</p>
	<p>b) The shadow formed would have two regions. A full shadow and a partial shadow.</p>	<p>(1 mark)</p>
<p>22.</p>	 <p>Correct circuit ✓</p> <p>Direction of current ✓</p>	<p>(2 marks)</p>
<p>23. a)</p>	<p>A pulse is a single disturbance that moves through a medium from one point to another.</p>	<p>(1 mark)</p>
	<p>b) The distance between two successive crests (or troughs)</p> <p>Or</p> <p>The distance between two successive points in a wave that are in phase.</p>	<p>(1 mark)</p>

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.	<p>Energy consumed = $\frac{4 \times 75 \times 6 \times 30}{1000} kWh$</p> <p>= 54 kW</p> <p>Cost = 54×9.30</p> <p>= Ksh. 502.20</p>	(3 mark)
31.	<ul style="list-style-type: none"> - 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 <p>(Any two correct)</p>	(2 mark)
32.	<ul style="list-style-type: none"> - 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. <p>(Any three @1 mark)</p>	(3 marks)
33.	Raise temperature/by doping	(1 mark)
34.	<ul style="list-style-type: none"> - Virtual - Diminished 	(2 mark)
35.	<p>Electrical kettle/electric iron/filament lamps/soldering gun/electric heater</p> <p>(1 mark for any one correct)</p>	(1 mark)