Biology (130 MARKS)

Answer <u>each</u> of the questions 1, 2 and 3.

Question 1. (52 Marks) *All* Items, (a), (b), (c), etc. (7 × 6 + 1 × 10marks)

(*a*) (*i*) **any *one* from:** eggs, beans, peas, lentils, nuts,… (3)
(*ii*) eat less foods from level from **A**/ eat more foods from level from **E** (3) **[6]**

(*b*) water (3)
glucose (3) **[6]**
accept: starch/ sugar/ named sugar for 'glucose'

(*c*) **A:** testa/ seed coat (3)
B: endosperm/ food **allow** (3) for cotyledon (3) **[6]**

(*d*) allows light into the eye/ transparent/ refracts light/ focuses light/ protection (3)
controls thickness (shape) of lens/ adjusts focus of lens (3) **[6]**

(*e*) **A:** membrane (3)
B: chromosomes/ genes/ DNA (3) **[6]**

(*f*) **A:** incisor (3)
B: chewing/ crushing/ grinding (3) **[6]**

(*g*) slug/ snail/ mussel/ bee/ wasp/ fly/ spider/ starfish/ prawn… (3)
fish/ lizard/ snake/ dog/ cat/ bird/ frog/ newt/ toad/ bat/ whale… (3) **[6]**

(*h*) **(*i*) any *two* methods explained from the list , 3 marks each:**
accept:
<u>composting</u>: decay of waste
<u>incineration</u>: burning
<u>landfill</u>: dumped in municipal (managed) site (2 × 3)
<u>recycling</u>: material is reused

(*ii*) advantage and disadvantage 2 marks each:

Method	Advantage	Disadvantage
Composting	releases minerals/ makes humus/ reduces volume of waste/ less landfill/ environmentally friendly …	can be smelly/ wood lice, worms, flies… live in and or on compost/ can attract vermin/ unsightly…
Incineration	reduces volume of waste/ valuable source of heat/ heat can be used to make electricity/ less landfill/ lower transport costs …	fear of release of dangerous materials into the air…
Landfill	easy, wastes not sorted/ wastes not processed environmentally unfriendly/…	can be smelly, can attract vermin/ poisonous substances may be released/ risk of fire/ water/ air pollution…
Recycling	materials re-used/ less landfill/ salvage of valuable substances/ reuse of some items producing different materials/ environmentally friendly …	materials such as paper pulp can only be recycled a few times/ can be more expensive than using new materials/ plastics difficult…

(2 × 2) **[10]**

Question 2. (39 marks) *All* items, (a), (b) and (c).

(*a*)	(*i*) Name	**A:** aorta	(3)	
		B: vena cava	(3)	**[6]**
		accept: artery for **A**, but not pulmonary. **accept:** vein for **B**, but not pulmonary		
	(*ii*) Describe	**any *two* from:** carbon dioxide (CO_2) removed (less CO_2)/ oxygen (O_2) added (more O_2) / water (H_2O) vapour removed	(2×3)	**[6]**
	What?	thin walls/ walls one cell thick	(3)	**[3]**
	(*iii*) Name	right ventricle	(3)	**[3]**
(*b*)	(*i*) Give	**any *two* from:** food passes from mother to baby/ oxygen passes from mother to baby/ wastes (CO_2, urea…) pass from baby to mother/ antibodies pass from mother to baby/ produces hormones (progesterone)/ water passes from mother to baby …	(2×3)	**[6]**
		accept: provides food, O_2 , H_2O and antibodies. Removes wastes or named waste		
	(*ii*) What?	**any *one* from:** carry nutrients or named nutrients to baby/ carry wastes from baby / transport…	(3)	**[3]**
	(*iii*) Describe	**any *four* from:** uterus contracts/ baby is moved to cervix/.cervix opens (dilates)/ amniotic sac breaks (the waters break)/ baby is pushed out/ umbilical cord is tied and cut/ the afterbirth (placenta and umbilical cord) is expelled/ breasts produce milk/ breast milk contains food and antibodies/ bonding between mother and baby…	(4×3)	**[12]**

Question 3. (39 marks) *All* items, (a) and (b).

(*a*)	(*i*) What?	transpiration	(3)	**[3]**
	(*ii*) Comment	steady/ even/ low/ little change… **accept:** uses little water/ slow	(3)	**[3]**
	(*iii*) Comment	increases/ rises/ greater **accept:** uses more water/ fast	(3)	**[3]**
	(*iv*) What	moving air (wind) temperature/ hotter	(3) (3)	**[6]**
	(*v*) Name	xylem	(3)	**[3]**
(*b*)	(*i*) Write	**any three organisms linked in the diagram starting with a green plant** e.g. green plant (grass), rabbit, fox	(3)	**[3]**
	(*ii*) What?	dead animals/ dead plants/ animal excretions/ fallen leaves/ humus…	(3)	**[3]**
	(*iii*) Give	**any adaptation linked to the diagram:** *fur* on fox (rabbit) (mouse), *wings* on butterfly (owl) (thrush), *hind legs* on grasshopper, leaves on green plant…	(3)	**[3]**
	(i*v*) Name	**any two animals linked in the diagram:** e.g. owl and fox could compete for prey	(2×3)	**[6]**
	(*v*) What?	living things (organisms) depend on each other **accept:** animals (plants) depend on each other **any** two way relationship between organisms. e.g. butterflies pollinate and get food from the flowers/ birds eat fruit and disperse seeds/ animals make CO_2 which is used by plants, plants make O_2 which is used by animals…	(3) (3)	**[6]**

Chemistry (130 MARKS)

Answer <u>each</u> of the questions 4, 5 and 6.

<u>Question 4. (52 marks) *All* items, (a), (b), (c), etc. (7 × 6 + 1 × 10marks)</u>

(*a*) alkali metals (3)
any *one* from: very reactive/ react with air / react with water/ produce hydrogen with water/ produce an alkaline solution when they react with water/ catch fire on water/ burn with coloured flame/ form ionic compounds/ one electron in outer shell… (3) **[6]**

(*b*) pH paper/ universal indicator/ pH meter (3)
read pH from (coloured) scale/ match with (coloured) scale/ read meter (3) **[6]**

(*c*) same atomic number/ same number of protons/ same element (3)
different mass numbers/ different numbers of neutrons/ different mass (3) **[6]**
matched

(*d*) **any *one* from:** water/ air/ oxygen (3)
any *one* from: coating with zinc (galvanising)/ painting/ greasing/ coating with tin (tin plating)/ use of 'sacrificial' metal e.g. magnesium… (3) **[6]**

(*e*) dissolve (add) copper sulfate (solute)/ evaporate (3)
no more copper sulfate (solute) will dissolve (3) **[6]**

(*f*) **any *two* from:** $CaCl_2$/ H_2O/ CO_2 (2 × 3) **[6]**
note formulae(as) *only* accepted

(*g*) manganese dioxide (manganese (IV) oxide MnO_2/ amylase (3)
decomposition of hydrogen peroxide (H_2O_2)/ preparation of O_2/ starch (3) **[6]**
matched

(*h*) **any *two* from:** degrades slowly/ burning plastic can release toxic fumes/ large amounts of chemical pollutants are produced by the manufacture of plastics/ large amounts of fossil fuels are use to make plastics/ plastic waste is unsightly in the environment/ expensive to dispose of… (2 × 2)
accept: more CO_2 in air (green house effect)/ animals eat plastic

non-biodegradable any *one* from: will ***not*** break down/ won't break down for many years/ can't be broken down by the organisms present on earth/ they do not occur in nature/ will not rot… (3)

any *one* from: made from renewable materials/ no fossil fuels used/ sustainable/ less greenhouse gas(CO_2) emissions (reduction in carbon footprint)/ environmentally 'friendly'/ less hazardous wastes produced in production/ can be composted/… (3) **[10]**

Question 5. (39 Marks) *All* items, (a), (b), (c), etc.

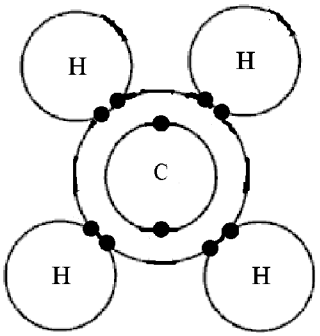
(*a*)	(*i*) What?	water	(3)	
	Give	anhydrous (white) copper sulphate/ blue cobalt chloride	(3)	
		accept: anhydrous cobalt chloride/ cobalt chloride paper		
		matched with: turns blue/ turns pink/	(3)	**[9]**
		accept a correct physical property and its correct value: density (3),1 g/cm^3 (3)/ mp (3), 0 ^{o}C (3)/ bp (3), 100 ^{o}C (3)		
	(*ii*) Identify	limewater	(3)	
	State	carbon dioxide/ CO_2	(3)	**[6]**
	(*iii*) Name	natural gas/ methane/coal/ turf (peat)…	(3)	**[3]**
(*b*)	(*i*) Distinguish	**elements:** only one kind of atom/ can not be decomposed/ simplest form of matter	(3)	
		compounds: two or more kinds of atom (elements) chemically combined/ can be decomposed	(3)	**[6]**
	(*ii*) Name	metals	(3)	
		non-metals	(3)	**[6]**
(c)	(*i*) Why?	magnesium combined chemically (reacted)/ compound formed…	(3)	**[3]**
	(*ii*) Where?	air/ oxygen…	(3)	**[3]**
	(*iii*) Give	magnesium oxide/ MgO	(3)	**[3]**

Question 6. (39 marks) *All* items, (a), (b) and (c).

(*a*) (*i*) What? two or more atoms combined chemically/ smallest particle of a substance /smallest particle that can exist on its own/ single atom, if it is an inert gas (3) **[3]**

(*ii*) What? covalent (3) **[3]**

(*iii*) Draw diagram as shown 6 marks (6)
allow 3 marks for showing the four bonds as dashes (lines) ***or*** (3) **[6]**



(*iv*) Describe positive and negative ions (3)
Name attract each other (3)
accept any two form the list: electron loss/ electron gain/ electron transfer/ ionic bond/ Na^+ and Cl^-/ attract for (2 × 3) marks
name of an ionic compound e.g. sodium chloride (3) **[9]**

(*b*) (*i*) Describe shake water with soap solution (flakes) (3)
any *one* from: hard water needs a lot of soap solution to form a lather (forms a scum)/ soft water only needs a small volume of soap solution to form a lather (no scum) (3)
or ***or***
shake with soap (3)
compare lather/ amount of soap (3) **[6]**
or ***or***
allow: water with soap solution (flakes) ***or*** water with soap for (3) marks (3)

(*ii*) Name compound of calcium (magnesium)/ correctly named compound of calcium (magnesium) e.g. calcium (magnesium) hydrogen carbonate/ calcium (magnesium) chloride/ calcium (magnesium) sulphate/ calcium (magnesium) ions…
as written, also accept any named compound of calcium (magnesium) (3) **[3]**

(*iii*) Would? soft
Justify ion-exchanger removes hardness (calcium, magnesium) (3)

How? shake water with soap solution (flakes) (3)
What? small amount needed to get to get a lather/ water is soft (3) **[9]**

Physics (130 MARKS)

Answer <u>each</u> of the questions 7, 8 and 9.

<u>Question 7. (52 marks) *All* items, (a), (b), (c), etc. (7 × 6 + 1 × 10marks)</u>

(*a*) magnetic field (3)
suspend magnet, one end points north/ end that repels north pole of compass needle/ end that repels north pole of another magnet… (3) **[6]**
accept: 'compass' alone for (3)

(*b*) (*i*) **A** (3)
(*ii*) **C** (3) **[6]**

(*c*) resistance to movement of one surface over another/ force that opposes motion (3)
any *one* from: smooth surfaces/ lubricant/ named lubricant/ choice of materials… (3) **[6]**

(*d*) **any *two* from:** light/ heat/ photosynthesis / food/ bio fuels/ wind/ waves/ fossil fuels/ light to electricity/ rain for hydropower… (2 × 3) **[6]**

(*e*) density decreases/ air expands/ balloon 'floats'/ air outside denser/ air outside colder… (6) **[6]**

(*f*) speaker emits sound (3)
table tennis (pith) ball suspended by thread moves (3) **[6]**
note: alternative experiments are acceptable

(*g*) like charges (3)
repel (3)

or
accept: static (3), electricity (3) **[6]**

(*h*) gravity (2)

force per unit area/ $\frac{force}{area}$ **accept:** $\frac{weight}{area}$ ***or*** weight per unit area (3)

Pa ***or*** N/m^2 ***or*** Nm^{-2} **accept:** any correct unit of pressure (2)

less air above/ less weight of air/ air exerts lower force… (3) **[10]**

Question 8. (39 marks) *All* items, (a), (b), (c), etc.

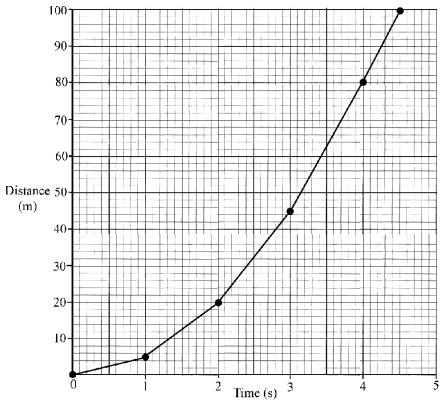
(*a*)	(*i*) What?	reflection	(3)	**[3]**
	(*ii*) What?	refraction	(3)	**[3]**
	(*iii*) What?	dispersion	(3)	**[3]**
	(*iv*) Give	**A** red **B** violet **accept** blue/ indigo **accept reverse order for** (3)	(3) (3)	**[6]**
	(*v*) Name	rainbow/ dispersion of sunlight by water in the atmosphere	(3)	**[3]**
(*b*)	(*i*) Why?	less electricity (current) (energy) used/ less fossil fuel burned	(3)	**[3]**
	(*ii*) Name	heat	(3)	**[3]**
	(*iii*) Which?	light	(3)	**[3]**
	(*iv*) Calculate	CFL $0.02\times100\times15 = 30$ cent other bulb $0.115\times100\times15 = 172.5$ cent = €1.725 **allow** (3) for the correct 'formula' once, then (3) for each correct calculation. Accept 'cent' or '€'. deduct one mark for each arithmetical slip. **assume** 'cent' if no monetary unit it is given except for '1.725' where the euro symbol is required. **note:** both correct answers given but no calculation shown award (3×3). One correct answer given but no calculation shown award (2×3). **note:** wrong numerical answer with no evidence of calculation gets no marks. €172.5 and €30 merit only (2) each.	(3×3)	**[9]**
	(*v*) Name	fridge/ cooker/ TV/ computer…	(3)	**[3]**

Question 9. (39 marks) *All* items, (a) and (b).

(*a*) (*i*) Draw — six points plotted correctly (6)

allow (3) for 3 – 5 points plotted correctly

curved line through the six points (3) **[9]**



(*ii*) Use — 60 m + ***or*** -4 m (3) **[3]**

(*iii*) Calculate — $\frac{80-20}{2} = 30$ (3)

m/s… (3) **[6]**

(*iv*) Is? — no (3)

curved graph/ graph not straight line/ stone accelerating… (3) **[6]**

(*b*) (*i*) What? — temperature of water in **A** decreases (water in **A** gets colder) and temperature of water in **B** increases (water in **B** gets hotter) (3) **[3]**

(*ii*) Explain — copper conducts (transfers) (3)

heat (3) **[6]**

(*iii*) What? — thermometer/ temperature probe (3) **[3]**

(*iv*) Name — **any *one* from:** wood/ plastic/ named plastic e.g. nylon… (3) **[3]**