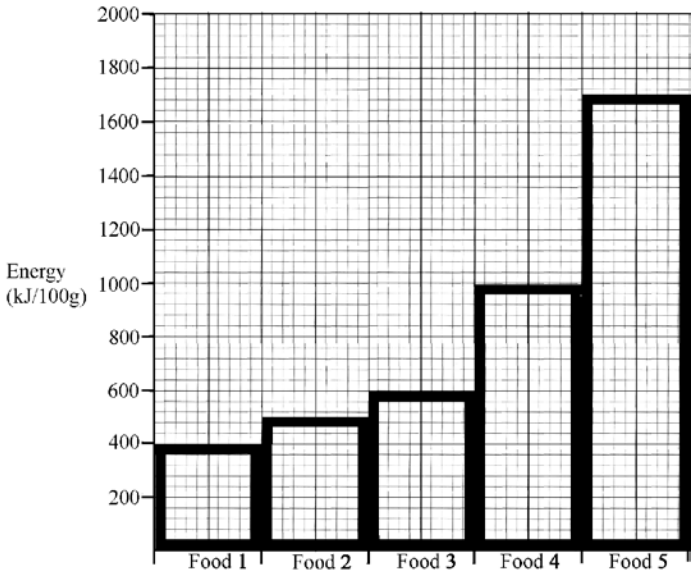
Biology (130 MARKS)

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

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

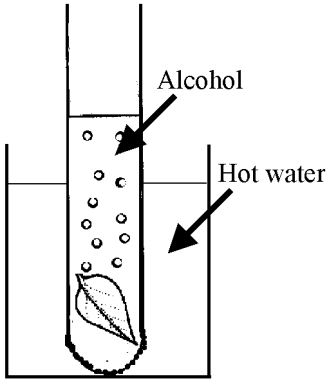
(*a*)	**any *two* from:** gills/ fins/ scales/ spines/ shape (streamlined)/ tail/ colour (camouflage) / lateral line…	(2 × 3)	**[6]**
(*b*)	**any *two* from:** urea/ water/ salts/… **accept urine for (3) if it is the *only* answer given**	(2 × 3)	**[6]**
(*c*)	**any *two* from:** brain/ eyes/ ear/ semicircular canals (organ of balance) / tongue…	(2 × 3)	**[6]**
(*d*)	**A:** cell wall **B:** nucleus	(3) (3)	**[6]**
(*e*)	**beneficial any *one* from:** decomposition/ decay/ food/ yoghurt/ vinegar/ cheese/ food supplements/ biotechnology/ insulin/ interferon/ healthy gut/ vaccination/ helps immune system/ antibiotics/ medicine / silage… **harmful any *one* from:** disease/ TB/ pneumonia/ meningitis/ tetanus/ cholera/ anthrax/ food poisoning/ tooth decay/ sore throat/ pimples…	(3) (3)	**[6]**
(*f*)	DNA protein	(3) (3)	**[6]**
(*g*)	**(*i*) what?:** phototropism **(*ii*) what?:** make more food/ more photosynthesis/ absorb more light…	(3) (3)	**[6]**
(*h*)	**candidate must clearly state names/ formulas of gases and directions of movement.** oxygen/ O_2 into bloodstream/ out of alveoli carbon dioxide/ CO_2 out of bloodstream/ into alveoli	 (2) (3) (2) (3)	**[10]**

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

(*a*)	(*i*) What?	breakdown of food	(3)	**[3]**
	(*ii*) Why?	make food soluble/ food can enter bloodstream/ to obtain nutrients…	(3)	**[3]**
	(*iii*) Name	**A:** liver	(3)	
		B: pancreas	(3)	**[6]**
	(*iv*) Give	**any *one* from:** kills bacteria/ digestion/ liquefies food/ mixes food/ produces HCl/ produces enzymes/ produces chyme…	(3)	**[3]**
	(*v*) Give	**any *one* from:** absorb water/ form faeces/ store (transport) (expel) faeces…	(3)	**[3]**
(*b*)	(*i*) Draw			
		five bars correct	(9)	
		or	***or***	
		four bars correct	(6)	
		or	***or***	
		three bars correct	(3)	**[9]**
		Tolerance ½ □		
	(*ii*) Which?	fat	(3)	
	What?	cheese has most fat/ more fat than other foods	(3)	**[6]**
	(*iii*) Describe	rub food on paper	(3)	
		translucent spot (translucent mark) (translucent stain)	(3)	**[6]**

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

(*a*)	(*i*) Why?	**any *one* from:** destarch leaves/ starch goes from leaves	(3)	**[3]**
	(*ii*) Why?	**any *one* from:** kill/ soften	(3)	**[3]**
	(*iii*) Draw	alcohol labelled correctly	(3)	
		hot water labelled correctly/ alcohol being heated	(3)	**[6]**



[no diagram deduct 3 marks]

	(*iv*) Name	iodine	(3)	**[3]**
	(*v*) Suggest	**any *one* from:** no starch/ no photosynthesis/ no chlorophyll (green pigment)	(3)	**[3]**
(*b*)	(*i*) Name	ovary	(3)	
	Role	contains ovules/ egg(s)/ female gamete(s)/ embryo(s)/ seed(s)	(3)	**[6]**
	(*ii*) Name	anther	(3)	
	Role	produces pollen/ male gametes/ sperm	(3)	**[6]**
	(*iii*) Give	**any *one* from:** insects/ wind/ named insect (bee) (fly)/ water…	(3)	**[3]**
	(i*v*) Name	Zygote **accept: fertilised egg**	(3)	**[3]**
	(*v*) What?	**any *one* from:** embryo/ seed/ plant **accept: fruit**	(3)	**[3]**

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>

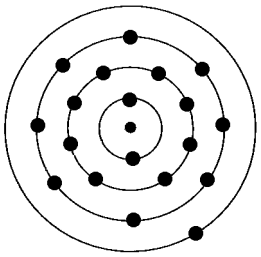
(*a*) **any *two* from *<u>either</u>* list *<u>or</u> one* from *<u>each</u>* list:** <u>Element Mg</u>: is 'silver'/ metal/ shines/ bends/ ductile/ malleable/ reacts with acids releasing hydrogen/ conducts electricity/ conducts heat/ burns in air (Oxygen)…
<u>Compound Mg O</u>: white/ powder/ base/ does not burn/ does not conduct electricity/ does not conduct heat… (2 × 3) **[6]**

note: *<u>two</u> different properties* must be given to merit (2 × 3), assume that *both* answers refer to magnesium if the candidate does not specify to which substance the properties given are assigned.

(*b*) **any *one* from:** dissolves/ erodes/ corrodes/ wears away (3)
any *one* from: limestone is calcium carbonate ($CaCO_3$)/ chemical reaction (3) **[6]**

(*c*) (*i*) **A** sand (3)
(*ii*) **B** water/ salt (3) **[6]**

(*d*)
two electrons in first orbit and eight in second orbit shown (3)



eight electrons in third orbit and one in fourth orbit shown (3) **[6]**

2, 8, 8, 1 with electrons not shown in diagram (3) only

(*e*) soft (3)
only water in **B**/ dissolved substances (solute) remains in **A**/ hardness removed by distillation (3) **[6]**

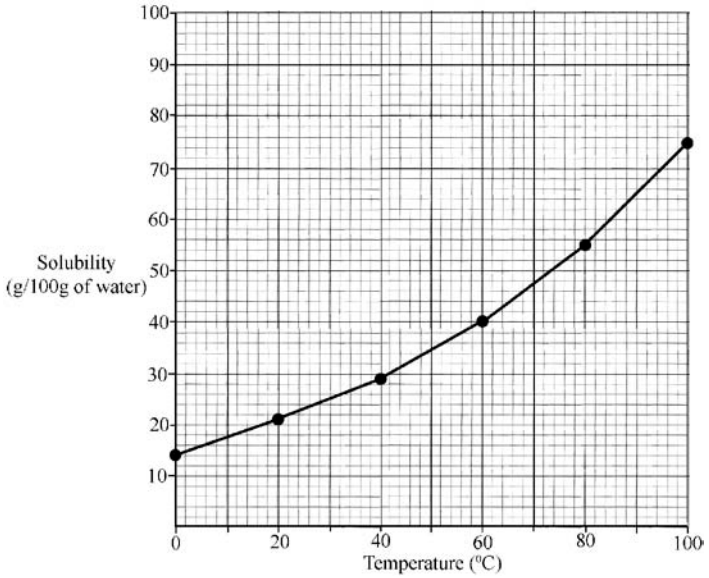
(*f*) **any *two* from:** fluoridation/ chlorination/ filtration/ screening/ settling/ ultra violet (UV)/ adjust pH/ flocculation/ ion exchange/ boiling… (2 × 3) **[6]**

(*g*) **any *two* from:** electricity/ heat/ sound (2 × 3) **[6]**

(*h*) (*i*) **A** (2)
(*ii*) to remove air (oxygen) (2)
(*iii*)to keep air (oxygen) out (2)
(*iv*) air (oxygen) is needed for rusting (4) **[10]**
accept air (oxygen) and water for (4) in (*iv*)
water alone zero in (*iv*)

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

(*a*) (*i*) Draw



(6)

six points plotted correctly
smooth curve (**accept** points joined by straight lines) (3) **[9]**
through all six points
allow (3) for four correct points
Tolerance ½ □

(*ii*) Use 15-18 (3) **[3]**

(*iii*) Describe **show *or* state: (Marks are awarded *only* for a diagram that is correct in context of the experiment described by the candidate.)** (3)
leave/cool (3)
crystals form (3)
filter/ evaporate (3)
suitable diagram ***or*** (3)
or
crystal on string in solution (3)
crystal grows (3)
remove crystal (using string) (3)
suitable diagram ***or*** (3)
or
heat solution (3)
evaporate water (3)
crystals form (3) **[12]**
suitable diagram

(*b*) (*i*) What? 0 – 14 (3)
any *one* *qualification* from: shows degree of acidity/ measures acidity/ shows degree of alkalinity (basicity)/ measures alkalinity (basicity)/ pH < 7 acid/ pH = 7 neutral/ pH > 7 alkali (base) (3)

How? **any *one* from:** pH paper/ pH meter/ pH probe / universal indicator (3) **[9]**

(*ii*) Name gastric juice (3)
blood (3) **[6]**

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

(*a*)	(*i*) Name	electrolysis	(3)	**[3]**
	(*ii*) Why?	conductivity	(3)	**[3]**
	(*iii*) Name	**A** oxygen/ O_2 (atomic symbol gets no marks)	(3)	
	Give	relights glowing splint	(3)	**[6]**
	(*iv*) Name	**B** hydrogen/ H_2 (atomic symbol gets no marks)	(3)	
	Give	burns with a pop **if names of gases *and* tests are *both* correct and *matched* but 'reversed' i.e. hydrogen for A (*iii*) and oxygen for B (*iv*) allow (2 × 3)**	(3)	**[6]**
	(*v*) What?	**A:B = 1:2/ B:A = 2:1**/ H_2O… **accept: 1:2 alone for (3)**	(3)	**[3]**
(*b*)	(*i*) Name	hydrogen/ H_2 (atomic symbol gets no marks)	(3)	**[3]**
	(*ii*) Name	hydrochloric (HCl)/ sulphuric acid (H_2SO_4)…	(3)	**[3]**
	(*iii*) Name	calcium (atomic symbol gets no marks, name only)	(3)	**[3]**
	(*iv*) Name	copper (atomic symbol gets no marks, name only)	(3)	**[3]**
	(*v*) List	Ca, Mg, Zn, Cu **accept *names* of metals in correct order for (3)**	(3)	**[3]**
	(*vi*) Give	wear eye protection/ use small amounts/ view through side of test tube/ gloves…	(3)	**[3]**

Physics (130 MARKS)

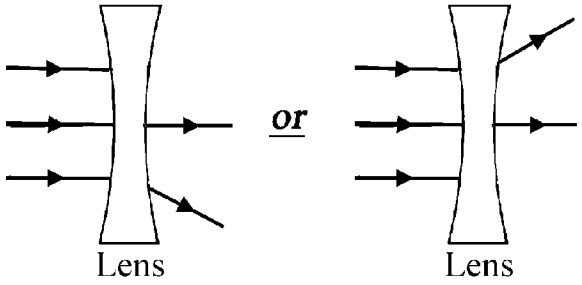
Answer <u>each</u> of the questions 7, 8 and 9.

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

(*a*) change of state/ liquid to solid/ latent heat (6) **[6]**

(*b*) less dense/ lower density (6) **[6]**

(*c*)



(3)
(3) **[6]**

3 marks for each correct emergent ray from either diagram to a max. of (2 × 3)
allow marks if line is drawn correctly but the arrow is omitted

(*d*) kiloWatthour/ kWh (3)
450/ €4.5 (3) **[6]**
allow (2) for €450/ 3 × 10 × 15

(*e*) $\frac{480000}{4}$ ***<u>or</u>*** 120 000 (3)
Nm^{-2} (N/m^2) (newtons per meter squared)/ Pa/ Pascal (3) **[6]**

(*f*) **any *two* from *<u>either</u>* list *<u>or</u>* *one* from *<u>each</u>* list:**
<u>Heat</u>: form of energy/ Joules/ can not be measured at a point/ can be converted into other forms of energy/ depends on mass (substance) (temperature)…
<u>Temperature</u>: measure of how hot (cold) (degree of hotness)/ Celsius (centigrade)/ can be measured at a point/ differences can cause heat to flow/ independent of mass (substance)/ measured with thermometer… (2 × 3) **[6]**
note: *<u>two</u> different points* must be made to merit (2 × 3),
it must be clear to which item the point is assigned in the candidate's answer.

(*g*) 30 × **X** = 3 × 40 (3)
X = 4 (3) **[6]**
allow 6 marks if '4' alone appears.

(*h*) (*i*) **B** (3)
(*ii*) forward bias/ + end (anode) of LED to + of battery/
- end (cathode) of LED to – of battery (3)
(*iii*) control (limit)current/ without **R** the diode would burn out (4) **[10]**

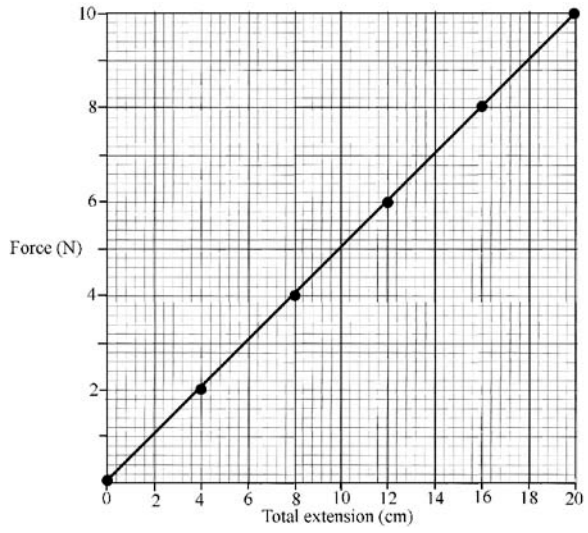
Question 8. (39 marks) *All* items, (a), (b), (c), etc.

(*a*) (*i*) Calculate

Force (N)	Scale reading (cm)	Total extension (cm)
0	31.0	0
2	35.0	4
4	39.0	8
6	43.0	12
8	47.0	16
10	51.0	20

five extensions correctly calculated (6) (6) **[6]**
3-4 extensions correctly calculated (3) only

(*ii*) Draw



six points (3)
plotted correctly (3) **[6]**
straight line through the six points
allow (3) for joining *any* six points

(*iii*) What? extension *directly* proportional to applied force (6) (6) **[6]**
extension proportional to applied force (3) only
accept reverse order: 'applied force *directly* proportional to extension' for (6). If 'directly' is omitted from above (3) only.

(*iv*) Use 7 +/- 0.1 (3) **[3]**

(*b*) (*i*) What? bubbles of air/ water level falls (3) **[3]**
(*ii*) Explain air in flask expanded (3) **[3]**

(*iii*) What? water rises up glass tube/ bubbles stop (3) **[3]**

(*iv*) Explain air in flask contracted/ air pressure in flask less than atmospheric/ partial vacuum (3) **[3]**

(*c*) Why? **any *one* from:** light faster/ sound slower (6) **[6]**

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

(*a*) (*i*) Name — **any *two* from:** hydropower/ wind/ tidal/ geothermal/ biomass/ infra red (IR) from the sun/ wave (2 × 3) **[6]**

(*ii*) Give — **any *two* from:** lower CO_2 emissions/ less carbon tax/ energy security/ lower energy costs/ sell surplus electricity/ sustainable/ cleaner/ kinder to the environment… (2 × 3) **[6]**

(*b*) (*i*) Complete

ray from mirror 1 to mirror 2 correctly drawn as shown (3) (3)

ray from mirror 2 to eye correctly drawn as shown (3) (3) **[6]**

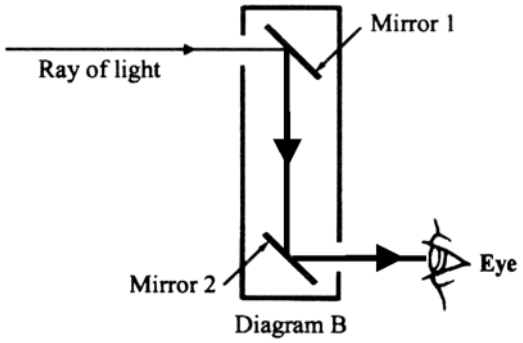


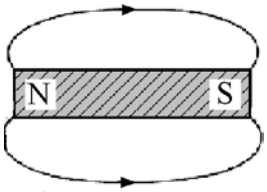
Diagram B

allow marks if line is drawn correctly but the arrow is omitted

(*ii*) Give — **any *one* from:** see over objects/ see around corners/ submarine… (3) **[3]**

(*c*) (*i*) Label

north or south pole correctly labelled (3) **[3]**



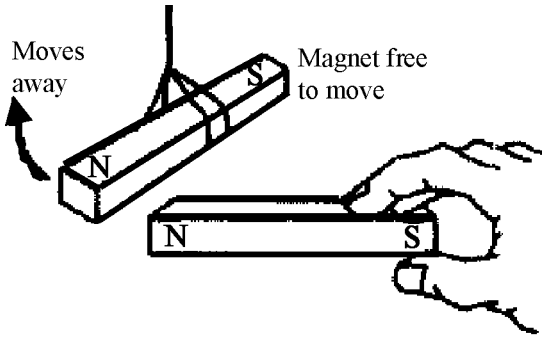
(*ii*) What? — the direction in which a magnetic compass needle points/ the direction in which an isolated north pole would move if free to do so **accept: direction of magnetic force** (3) **[3]**

(*iii*) Describe — **show *or* state**

bring a magnet towards a second magnet that is free to move

if two north poles or two south poles are brought close to each other they repel each other (3) **[6]**

[no diagram deduct 3 marks]



(*iv*) Name — **any *one* from:** iron/ steel/ cobalt/ nickel (3) **[3]**

(*v*) How? — the earths magnetism turns the needle of a magnetic compass/ use a compass/ freely suspended bar magnets north pole points north… (3) **[3]**