Biology (130 MARKS)

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

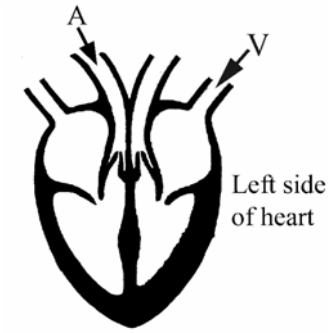
<u>Question 1. (52 Marks)</u> *All* Items, (a), (b), (c), etc. (7 × 6 + 1 × 10marks)

(*a*) **any *two* from:** <u>photosynthesis</u> (make food)/ <u>gaseous exchange</u> (gases enter and leave the leaf) (carbon dioxide in or out) (oxygen out or in)/ <u>transpiration.</u>(water vapour out of leaf)/ <u>food storage</u>/ <u>respiration</u> (2 × 3) **[6]**
note: names of processes are underlined, accept descriptions in brackets.

(*b*) **(*i*) name:** kidney (3)
(*ii*) function: excretion/ make urine/ excrete (remove form the body) water (salts) (urea)... (3) **[6]**

(*c*) **(*i*) what?:** magnification/ make small things appear larger/ see cells (3)
(*ii*) name: stage (3) **[6]**

(*d*) **label**



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

(*e*) **(*i*) why? any *one* from:** colonise new places/ reduce competition (overcrowding)/ increase survival (3)
(*ii*) give, any *one* from: animal/ self/ water (3) **[6]**

(*f*) **(*i*) why?:** move/ meet the egg (3)
(*ii*) where?: fallopian tube (oviduct)/ ovary (ovule) of plants (3) **[6]**

(*g*) **(*i*) name, any *one* from:** buttercup/ grass/ raspberry / strawberry/ daffodil/ onion/ garlic/ potato/ spider plant...**accept:** mushroom (3)
(*ii*) describe, matched to named plant: <u>runners or rhizomes</u> (buttercup/ grass/ raspberry / strawberry)/ <u>bulbs or corms (</u>onion/ garlic)/ <u>tubers</u> (potato)/ <u>plantlets (</u>spider plant)... (3) **[6]**
note: mode of reproduction underlined, matched plants in brackets.
accept: cutting/ layering…

(*h*) **(*i*) what?:** (feed) (supply nutrients) (food) (growing medium) (3)
(*ii*) why?: control/ check that agar is not contaminated (3)
(*iii*) describe: patches on the surface (growth) (2)
explain any *one* from: micro-organisms/ bacteria/ fungi are growing (2) **[10]**

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

(*a*)	(*i*) Name	**bone A:** humerus	(3)	
		bone B: femur	(3)	**[6]**
	(*ii*) What?	**type of joint:** hinge	(3)	**[3]**
	(*iii*) Give	**function of C any *one* from:** lubricates/ helps free movement/ reduces friction	(3)	
		function of D: holds the bones together	(3)	**[6]**
	(*iv*) Explain	**show or state:**		
		pairs of muscles that (they) pull (contract) (work)	(3)	
		in opposite directions	(3)	**[6]**
(*b*)	(*i*) Name	**liquid A:** limewater	(3)	**[3]**
	(*ii*) Which?	X	(3)	**[3]**
	(*iii*) Why?	carbon dioxide (CO_2)	(3)	**[3]**
	(*iv*) What?	**conclusion:** more carbon dioxide in exhaled air	(3)	**[3]**
	(*v*) Complete	oxygen (O_2)	(3)	
		carbon dioxide (CO_2)	(3)	**[6]**

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

(*a*)	(*i*) How?	any suitable method e.g. throw	(3)	**[3]**
	(*ii*) Give	names (types) of plants (animals) present	(3)	
		number (frequency) (%) of each plant (animal) present	(3)	**[6]**
(*b*)	(*i*) What?	length of string (rope) with a mark (knot) every metre (at intervals)	(3)	**[3]**
	(*ii*) Describe	line across area to be sampled	(3)	
		identify plant (animal) present at each metre (mark)	(3)	**[6]**
(*c*)	(*i*) Name	**any *one* from:** pooter/ pitfall trap/ beating tray/ Tullgren funnel/ plankton net/ small mammal trap...	(3)	**[3]**
	(*ii*) Draw	drawing of item named in part (*c*) sub-part (*i*)	(3)	
		one correct label, ***not* name of item**	(3)	**[6]**
	(*iii*) Describe	two clear statements describing the use of the item named in part (*c*) sub-part (*i*)	(2 × 3)	**[6]**
(*d*)	Give	**any *two* from:** presence of herbivores/ presence of carnivores/ presence of insects for pollination/ presence of nitrogen fixers/ type of soil/ soil drainage/ minerals in soil/ pH of soil/ air content of soil/ amount of humus in soil/ water content of soil / light levels/ exposure to wind/ exposure to frost/ elevation/ salinity/ aeration of water/ currents in water/ competition/ coniferous trees/ deciduous trees...	(2 × 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*)	**name, any *one* from:** carbon dioxide/ sulphur dioxide/ oxides of nitrogen/ smoke/ small particles...	(3)	
	describe, any *one* from (matched): global warming/ greenhouse effect/ acid rain/ kill plants/ kill fish/ damage to lungs/ lung disease/ damage to stone buildings/ damage to iron structures/ corrosion...	(3)	**[6]**
	If a candidate gets *zero* for the *name* but *gives a correct effect of a pollutant* present in the emissions e.g. global warming allow (3)		
(*b*)	**(*i*) give, any *one* from:** can flow/ allow diffusion/ don't have definite shape/ take shape of container...	(3)	
	(*ii*) give, any *one* from: gases are compressible (liquids are incompressible)/ gases have lower density (liquids have higher density)/ gases fill container...	(3)	**[6]**
(*c*)	**name, any *two* from:** Bunsen burner/ tripod/ pipe clay triangle/ crucible/ tubing/ evaporating dish	(2 × 3)	**[6]**
(*d*)	**draw, drawing of apparatus used for:** filtration/ decanting	(3)	
	one correct label	(3)	**[6]**
(*e*)	**(*i*) how?:** seven	(3)	
	(*ii*) enter: isotopes	(3)	**[6]**
(*f*)	**(*i*) what?:** measure volume	(3)	
	(*ii*) what any *one* from?: neutralisation/ salt formed/ water formed	(3)	**[6]**
	accept: indicator changes colour		
(*g*)	**give any *two* from:** fizzy drinks/ fire extinguishers/ dry ice/ photosynthesis/ stage effects/ refrigerant	(2 × 3)	**[6]**
(*h*)	**(*i*) describe:** burn/ light	(2)	
	'popping' sound heard	(2)	
	(*ii*) write: reactants: $Zn + 2HCl$	(3)	
	products: $ZnCl_2 + H_2$	(3)	**[10]**

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

(*a*)	(*i*) Name	**liquid A:** hydrogen peroxide (H_2O_2)	(3)	**[3]**
	(*ii*) Name	**solid B:** manganese dioxide (MnO_2)	(3)	**[3]**
	(*iii*) What?	**catalyst:** speeds up (slows down) (changes rate) of a chemical reaction	(3)	**[3]**
	(*iv*) Give	**result:** turned red	(3)	
		conclusion: acidic	(3)	**[6]**
(*b*)	(*i*) State	**test:** add soap	(3)	
		scum forms/ a lot of soap needed to form a lather	(3)	**[6]**
	(*ii*) Name	**metallic element:** calcium/ magnesium/ iron/ aluminium	(3)	**[3]**
	(*iii*) Give	**any *one* from:** limescale in kettles/ limescale in washing machines/ limescale in hot water pipes/ blocks pipes/ wastes soap/ source of calcium/ good for brewing/ may reduce heart disease/ limescale... **accept:** scum forms/ a lot of soap needed to form a lather **if it *does not* appear in the test (*i*) above**	(3)	**[3]**
(*c*)	(*i*) Name	distillation	(3)	**[3]**
	(*ii*) Name	condenser	(3)	**[3]**
	(*iii*) Identify	part B	(3)	**[3]**
	(*iv*) How?	**any *one* from:** evaporate/ no residue	(3)	**[3]**

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

(*a*)	(*i*) Name	covalent	(3)	**[3]**
	(*ii*) Describe	shared electrons	(3) (3)	**[6]**
	(*iii*) Name	**any *one* from:** carbon dioxide/ ammonia/ glucose/ methane... **accept any *one* from:** oxygen/ hydrogen/ nitrogen/ chlorine...	(3)	**[3]**
(*b*)	(*i*) How?	**sodium ions:** loses one electron **chloride ions:** gains one electron **accept:** loss, gain (order not important) for (3) only **accept:** loss, gain (order important) of electrons for (6) **accept:** sodium gives one electron to chlorine for (6)	(3) (3)	**[6]**
	(*ii*) What?	electrical/ attraction of opposite charges	(3)	**[3]**
	(*iii*) Name	**any *one* from:** magnesium oxide/ magnesium chloride/ calcium oxide/ calcium chloride/ potassium iodide...	(3)	**[3]**
(*c*)	(*i*) What?	mixture of metals/ iron and carbon (carbon steels)	(3)	**[3]**
	(*ii*) Name Give	**alloy, any *one* from:** aluminium alloys/ brass/ carbon steels/ solder/ stainless steel/ steel... **note:** use to be matched with name **use, any *one* from:** [drink can/ rivets/ piston/ ladder/ cooking foil/ letter box/ door handles...] [hinges/ bolts and nuts/ screws/ plug pins/ keys/ musical instruments ...] [girder/ hinges/ bolts and nuts/ screws/ food cans/ scaffolding/ car bodies/ tools/ machinery...] [connect metals] [pipes/ cutlery/ pots/ pans/ sinks/ 'irons'...] **note: lists in square brackets of uses are in same order as list of names of alloys above.**	(3) (3)	**[6]**
	(*iii*) Explain	**malleable:** hammered (pressed) (flattened) **ductile:** pulled (strectched)	(3) (3)	**[6]**

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*)	**<u>useful</u> energy conversions:**			
	(*i*) electrical (electric) to magnetic	(3)		
	(*ii*) magnetic to kinetic	(3)	**[6]**	
	allow (3) for: 'electrical to kinetic' if it is the only correct answer given.			
(*b*)	**conclusion:** best (better)	(3)		
	conductor	(3)	**[6]**	
	accept: aluminium (iron) conduct less well (poorer) for (6)			
(*c*)	**why?:** pressure	(3)		
	increases with depth/ greater	(3)	**[6]**	
(*d*)	**(*i*) why?:** pen has charge (static) (electricity)	(3)		
	(*ii*) explain: pen loses its (charge) (static) (electricity)	(3)	**[6]**	
(*e*)	**(*i*) where?:** the sun	(3)		
	(*ii*) what?: it travels in straight lines	(3)	**[6]**	
(*f*)	**(*i*) what?:** it moves	(3)		
	(*ii*) which?: magnetic	(3)	**[6]**	
(*g*)	**what?:** reflection (bounce)	(3)		
	sound	(3)	**[6]**	
(*h*)	**(*i*) does?:** yes	(2)		
	reason: bulbs in parallel/ two paths for current/ one path is not broken	(3)		
	(*ii*) does?: no	(2)		
	reason: bulbs in series/ single path is broken	(3)	**[10]**	

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

(*a*) (*i*) Name

item A: overflow can (3)
item B: measuring (graduated) cylinder (3) **[6]**
allow (3) for items named in reverse order

(*ii*) Calculate
Give

density: $\frac{175}{125}$ gets (2) / 1.4 gets (3) (3)
units: g/cm^3 ***or*** gcm^{-3} ***or*** grams per cubic centimetre (3) **[6]**

(*iii*) Why?

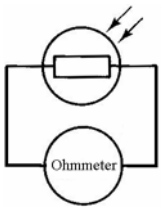
sink: denser (3) **[3]**

(*b*) (*i*) Give

everyday use any *one* from: measure light/ switch on (off) lights/ light sensor/ alarms/ street lights/ camera... (3) **[3]**

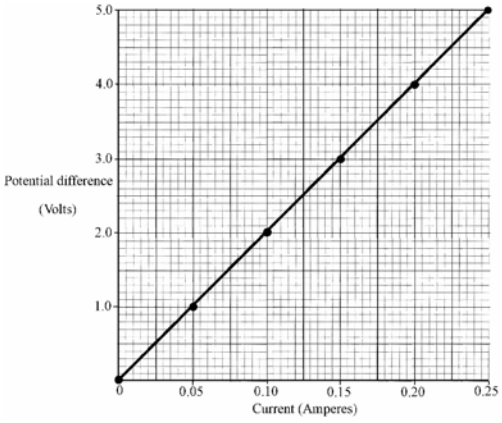
(*ii*) Describe
Draw
Explain

experiment show or state: connect the LDR to a meter that measures resistance (ohmmeter) (3)



circuit diagram: LDR symbol correct (3)
accept Ω in a circle as the symbol for an ohmmeter
explain: move light source closer (further away) from the LDR/ shade the LDR with your hand... (3) **[9]**

(*c*) (*i*) Draw



graph: five points plotted correctly (3)
line drawn through the six points (3) **[6]**
allow (6) for correct line only

(*ii*) Calculate

resistance: any correct ratio e.g. $\frac{4}{0.2}$ gets (2) / 20 gets (3) (3) **[3]**

(*iii*) What?

evidence: straight line through the origin (3) **[3]**

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

(*a*)	(*i*) Why?	**chips:** give a smooth boil/ prevent 'explosive' boiling/ safety	(3)	**[3]**
	(*ii*) What?	**temperature:** $100^{o}C$	(3)	**[3]**
	(*iii*) What?	**raising pressure:** raises boiling point	(3)	**[3]**
	(*iv*) What?	**lowering pressure:** lowers boiling point	(3)	**[3]**
(*b*)	(*i*) How?	**heat from sun:** radiation/ infra red/ IR	(3)	**[3]**
	(*ii*) Give	**advantage, any *one* from:** reduce fuel bills/ reduce CO_2 emissions/ renewable/ ... ***or*** **disadvantage, any *one* from:** expensive/ less heat absorbed in winter (on cloudy days)...	(3) ***or*** (3)	**[3]**
(*c*)	(*i*) Define	**velocity, any *one* from:** speed/ distance travelled in unit time with direction of motion (in given direction) **allow (6) for:** rate of displacement	(3) (3)	**[6]**
	(*ii*) Use Give	**acceleration:** any correct ratio e.g. $\frac{20}{2}$ gets (2) / 10 gets (3) **units:** m/s/s ***or*** ms^{-2} ***or*** metres per second per second ***or*** m/s^2	(3) (3)	**[6]**
	(*iii*) Name	**force:** gravity	(3)	**[3]**
	(*iv*) What? Give	**weight:** 20/ 19.6 (i.e. using $g = 9.8\ m/s^2$) **allow:** 2×10 ***or*** 2×9.8 (2) **unit:** N/ Newton	(3) (3)	**[6]**