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:** protein (amino acids)/ fat/ carbohydrate (sugar)/ minerals/ vitamins… **do not accept:** starch	(2 × 3)	**[6]**
(*b*)	contains cells **any** *one* **from**: oxygen/ carbon dioxide/ food/ name of digested food/ wastes/ urea/ ions/ hormones/ water/ minerals/ vitamins/ cholesterol/ … **accept:** alcohol/ drugs	(3) (3)	**[6]**
(*c*)	**any** *one* **from**: release of carbon dioxide (methane) (nitrous oxide)/ burning fossil fuels/ deforestation… **any** *one* **from**: sea level rise/ sea temperature rise/ drop of oxygen in seas/ heat waves/ floods/ fires/ drought/ melting of glaciers (polar ice sheets)/ malnutrition/ increase in spread of infectious diseases/ famine/ changes in ocean currents/ weather changes…	(3) (3)	**[6]**
(*d*)	**any** *one* **from**: prevention of the fusion of gametes (sperm and egg)/ prevention of fertilisation/ prevention of pregnancy **any** *one* **from**: breast feeding may prevent ovulation/ diaphragm/ condom/ pill/ IUD (intrauterine devices)/ spermicides/ bar (hormonal implant)/ rhythm method (inetrcourse outside the woman's fertile time)…	(3) (3)	**[6]**
(*e*)	**any** *one* **from**: transports water/ minerals transports sucrose (sugar) (food) **allow** (3) for reverse order	(3) (3)	**[6]**
(*f*)	DNA protein	(3) (3)	**[6]**
(*g*)	grass/ potato/ strawberry/ onion/ crocus… underground stems (rhizomes)/ tuber/ runner (stolon)/ bulb/ corm… **note**: name and mode of asexual reproduction must be matched for 2nd (3)	(3) (3)	**[6]**
(*h*)	hinge motion in one plane/ backward and forward/ up and down/ raise and lower the biceps (muscle) contracts bringing bones closer… the triceps (muscle) contracts bringing bones apart… ***or*** antagonistic muscles (biceps & triceps) (pair of muscles) cause movement in opposite directions… **do not accept:** 'one direction' for movements or muscles 'expand' causing movement	(2) (2) (3) (3) ***or*** (3) (3)	**[10]**

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

(*a*)	Give	**any *five* from**: renal artery: brings blood to the kidney kidney: filters blood/ removes waste/ excretes /makes urine/ cleans blood/ helps water balance… renal vein: collects blood from the kidney/ returns blood to body (heart) ureter: carries urine (wastes) (urea) from the kidneys to the bladder bladder: collects (stores) urine urethra: releases urine/. allows sperm to leave	(5×3)	**[15]**
(*b*)	(*i*) Name	gas in: carbon dioxide (CO_2) gas out: oxygen (O_2)/ water vapour (H_2O)	(3) (3)	**[6]**
	(*iii*) Describe	**show *or* state:** cover leaf of plant with aluminium foil plant in dark for some time / de-starch plant plant in bright light for some time remove chlorophyll (boil in alcohol) add iodine to leaves only leaf exposed to light goes blue-black	 (3) (3) (3) (3) (3) (3)	**[18]**

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

(*a*)	(*i*) Give	Wind/ water/ artificial e.g. using a brush… **accept:** named animal that pollinates	(3)	**[3]**
	(*ii*) Draw	stigma drawn and labelled correctly style drawn and labelled correctly ovary drawn and labelled correctly anther drawn and labelled correctly filament drawn and labelled correctly **if a carpel and a stamen are drawn separately (alone) allow marks for correctly labelled parts. Deduct [3] for no flower.**	(3) (3) (3) (3) (3)	**[15]**
	(*iii*) Name	anther **do not accept:** stamen	(3)	**[3]**
	(*iv*) Name	ovule **accept:** ovary **do not accept:** carpel	(3)	**[3]**
	(*v*) What?	zygote/ seed formation (dispersal)/ fruit formation	(3)	**[3]**
(*b*)	(*i*) Name	amylase	(3)	**[3]**
	(*ii*) Name	starch	(3)	**[3]**
	(*iii*) Name	maltose	(3)	**[3]**
	(i*v*) What?	**any** *one* **from**: iodine solution/ Benedict's solution/ Fehling's solution	(3)	**[3]**

Chemistry (130 MARKS)

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

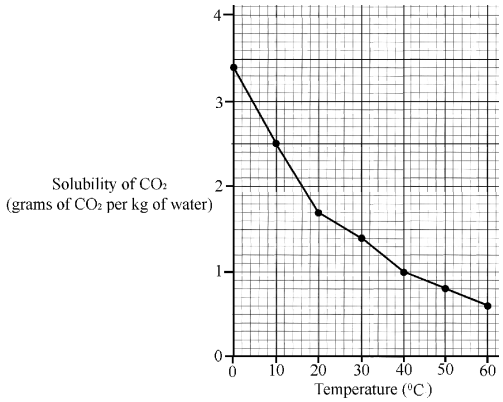
<u>Question 4. (52 marks) *All* items, (a), (b), (c), etc. (7 × 6 + 1 × 10marks)</u>

(*a*)	**any *one* from**: solder/ steel/ brass/ bronze… **one use *correctly* matched**: <u>solder</u>-joining metals/ <u>steel</u>-girders, car bodies, tools, nails, screws, hinges…/ <u>brass</u>-plug pins, keys, musical instruments, hinges, screws, door handles…/ <u>bronze</u>-sculptures, bells, coins, medals, bearings, springs, hammers, ships propeller…	(3) (3)	**[6]**
(*b*)	carbon dioxide/ CO_2 blue turns red	(3) (3)	**[6]**
(*c*)	hard water limescale/ calcium carbonate/ magnesium carbonate/ correct formula	(3) (3)	**[6]**
(*d*)	Ca, Mg, Zn, Cu **allow** (3) for reverse order/ using names not symbols in correct order	(6)	**[6]**
(*e*)	ionic oppositely charged ions (positive and negative ions) (Na^+ and Cl^-) attract	(3) (3)	**[6]**
(*f*)	**any *one* from**: orange juice/ rainwater/ vinegar/ sour milk/ cola **any *one* from**: toothpaste/ bread soda/ milk of magnesia/ washing soda 9g	(3) (3)	**[6]**
(*g*)	**any *two* <u>names</u> or symbols:** H, He, B, C, N, O, F, Ne, Si, P, S, Cl, Ar, As, Se, Br, Kr, Te, I, Xe, Rn	(2 × 3)	**[6]**
(*h*)	(*i*) because the ink dot would dissolve into the liquid/ ink would not rise up the paper/ ink soluble	(4)	
	(*ii*) they were carried up by the liquid/ capillarity	(4)	
	(*iii*) the brown ink was a mixture of inks/ made up of different colours	(2)	**[10]**

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

(*a*) (*i*) Draw

seven points correctly plotted (6)
allow (3) for four points correctly plotted
curve through plotted points (3) **[9]**



(*ii*) Suggest

any *one* from: increase the motion of gases/ allow them to escape/ weak attractive forces / gases expand/ gases rise/ gases less dense/ bubbles form/ gas molecules have more energy… (3) **[3]**

(*iii*) Estimate

16 ^{0}C +/- 2 ^{0}C (3) **[3]**
allow (2) for 10.6 ^{0}C

(*b*) (*i*) Which?

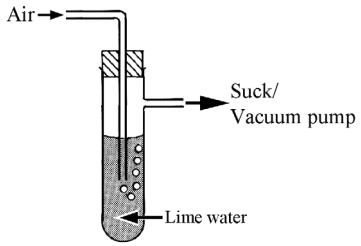
CO_2, H_2O (2×3) **[6]**

(*ii*) Suggest

any *one* from: temperature changes/ weather/ evaporation / rain/ snow/ transpiration/ plants/ respiration/ combustion/ photosynthesis/ specified location… (3) **[3]**

(c) Describe

show *or* state:
draw air through (3)
lime water (3)
lime water goes milky (3) **[9]**
[no diagram deduct 3 marks, one label is required]



(d) Give

anhydrous (white) copper sulphate/ cobalt chloride paper (3)
matched: turns blue/turns pink (3) **[6]**
allow (3) for 'turns blue' if anhydrous ***or*** white is omitted above

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

(*a*)	Name and Describe (*i*) to (*iv*)	**accept correct processes in *any* order.** **any *four* named from**: screening/ flocculation/ sedimentation (settling) / filtration/ ion exchange/ pH adjustment/ adsorption/ named mode of disinfect ion: (chlorination) (ozonization) (uv) (irradiation)/ fluoridation	(4×3)	
		any *four described and correctly* matched, from: removal of large items/ combine (coagulate) small particles into larger particles/ particles sink to bottom/ filtration clarifies water (remove all particles from the water) (water passed through sand filters)/ remove unwanted dissolved materials/ base added to prevent corrosion of pipes/ taste, (colour) and (odour) causing compounds can stick to powder (activated carbon) and are removed/ add chlorine (kills micro-organisms) (bacteria…) (safe to drink)/ add fluoride (help prevent tooth decay)	(4×3)	**[24]**
(*b*)	Rule (*i*) and Rule (*ii*)	**any *two* from**: do not enter the laboratory without permission/ do not use any item without permission/ do not use any item without knowing how to use it/ tie back long hair/ wear eye protection when necessary/ check the label on the container before using some of the contents/ never eat in a laboratory/ if you get something into to you mouth by accident, spit it out and inform your teacher/ any accident must be reported to the teacher immediately/ chemical spills must be reported and cleaned up/ wear a laboratory coat always/ wash chemicals from eyes and skin immediately and report to your teacher/ wash your hands before leaving…	(2×3)	**[6]**
(*c*)	Name	correctly named alkali metal e.g. potassium	(3)	
	Describe	burns/ flame/ sparks/ explodes…	(3)	
		e.g. potassium hydroxide (KOH)/ hydrogen (H_2**)**	(3)	**[9]**

Physics (130 MARKS)

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

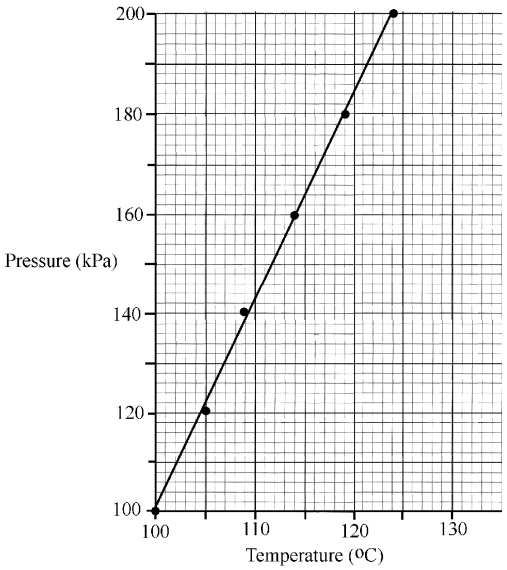
<u>Question 7. (52 marks) *All* items, (a), (b), (c), etc. (7 × 6 + 1 × 10marks)</u>

(*a*)	liquid to gas (vapour)	(3)	
	energy/ heat	(3)	**[6]**
(*b*)	dc: flows in one direction	(3)	
	ac: flows in one direction and then in the opposite direction/ changes direction	(3)	**[6]**
	do not accept: 'stays the same' for dc or 'changes' for ac. What 'stays the same' or 'changes' i.e. direction must be specified.		
(*c*)	refraction	(6)	
	or	***or***	
	light changes direction (bends)	(3)	
	when it enters (leaves) the drink	(3)	**[6]**
(*d*)	**any *two* from:** falling down the stairs: potential energy to kinetic energy and sound energy/ car: chemical energy to kinetic and heat energy/ photosynthesis: nuclear energy to light energy to chemical energy/ washing machine: electrical energy to heat, kinetic and sound energy/ respiration: chemical energy to heat energy and kinetic energy…	(2 × 3)	**[6]**
	note: single conversions, e.g. door bell: electrical energy to sound energy, is all that is required for (3). Two correct single conversions merit (2 × 3)		
(*e*)	Heat/ high temperature	(3)	
	expansion	(3)	**[6]**
(*f*)	hole at bottom	(3)	
	greater pressure/ greater depth	(3)	**[6]**
(*g*)	too much current causes the wire to melt	(3)	
	breaking the circuit	(3)	**[6]**
	accept: fuse blows/ limits amount of current for (3)		
(*h*)	**note:** no marks for selecting two energies		
	(*i*) **any *two, correctly* matched, from:** no carbon dioxide (CO_2) produced/ carbon dioxide (CO_2) removed absorbed)/ carbon neutral/. hydroelectric plants are long-lived/ solar heating can provide hot water/ solar power panels supply electricity / tidal generators are submerged (their rotors turn slowly) (sea life is safe)/ wave	(2)	
	generators are moored off-shore (just 'bob up and down')…	(3)	
	(*ii*) **any *two, correctly* matched, from:** wind turbines, in some areas, are objected to as unsightly (noise) (kill birds)/ large solar power plants use a lot of water (need huge area) the rest of this list also applies to solar heating (direction of the sun changes) (changes in seasons) (day to night) (cloud cover)/ the construction of hydroelectric plants can cause dislocation of people (release of large amounts of carbon dioxide due cement production required)/ biomass uses land that could	(2)	
	be used for food production (uses food crops to make biofuels)…	(3)	**[10]**
	do not accept: 'expensive' or 'not expensive' for (*i*) or (*ii*), a definition of renewable energy for (*i*) e.g. 'will not run out'. **Look for:** items (*i*) & (*ii*) specific to candidate-selected energies.		

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

(*a*) Define $\frac{force}{area}$ / force per unit area (3) **[3]**

(*i*) Draw six points correctly plotted (6)
allow (3) for four points correctly plotted
straight line through, or close to, six points (3) **[9]**



(*ii*) What? boiling point increases with pressure/ (3)
linear (straight line) (increase in boiling point is proportional to increase in pressure) (3) **[6]**

(*iii*) What? reduce boiling point (3) **[3]**

(*b*) (*i*) Give **any *two* from:** review cost of electricity on a daily basis/ locate what part of the house costs most (least)/ budget (save money)/ much better than alternative; reading supplier's meter and calculating… (2 × 3) **[6]**

(*ii*) Define Joules per second (J/s) (Js^{-1})**/** Nm per second/ $kgms^{-3}$…
accept: rate of doing work/ rate of energy conversion/ $\frac{work}{time}$ / $\frac{energy}{time}$ (6) **[6]**

(*iii*) State chemical effect, **any *one* from:** electroplating/ charging a battery/ anodising/ electrolysis… (3)
magnetic effect, **any *one* from:** electromagnet/ door bell/ electric motor/ transformer/ loudspeaker/ relay/ car door locks/ ac adapter… (3) **[6]**

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

(*a*)	(*i*) Name	**B** resistor	(3)	
		C LED (light emitting diode)	(3)	**[6]**
	(*ii*) Give	**A** supplies electricity (electrical energy), (direct current), (DC), (energy), (power), (current)…	(3)	
		B controls (regulates) (reduces) current/ protects LED	(3)	**[6]**
	(*iii*)	circuit	(3)	
	Produce	LDR	(3)	
		Ohmmeter/ multimeter set to measure Ohms	(3)	**[9]**
(*b*)	Why?	comb has charge/ static electricity	(6)	**[6]**
(*c*)	(*ii*)	like poles	(3)	
	Explain	repel	(3)	**[6]**
(*d*)	(*iii*)	gravity	(3)	
	What?	holds the earth together/ causes weight/ keeps the planets in orbit about the sun/ holds atmosphere/ tides…	(3)	**[6]**