



General Certificate of Secondary Education
2011

Science: Biology

Paper 1
Higher Tier

[G0903]

THURSDAY 19 MAY, AFTERNOON

**MARK
SCHEME**

		AVAILABLE MARKS	
1	(a) Water;	[1]	5
	Chlorophyll;	[1]	
	Sugar/glucose/starch;	[1]	
	(b) Any PAIR [<i>mineral</i> + <i>appropriate use</i>] from: Calcium; Cell walls; Magnesium; Chlorophyll; Nitrate; Growth/protein production/amino acid production;	[2]	
2	(a) Carbohydrates;	[1]	6
	Proteins;	[1]	
	(b) Protects baby from infection/confers immunity;	[1]	
	(c) Any two from: Convenience (correct temp/no sterilising bottles); Maternal bond/security/love; Easier absorbed/digested; Easier to wean; Helps prevent childhood diabetes; Less cost; Help prevent breast/ovarian cancer in mother;	[2]	
(d) May pass virus on to baby/would be in milk;	[1]		
3	(a) A – combustion/burning;	[1]	6
	B – photosynthesis;	[1]	
	C – respiration;	[1]	
(b) animal eats plant; made into animal <u>carbohydrates/fats/proteins</u> ;	[2]		
(c) Coal/natural gas/oil/peat;	[1]		

		AVAILABLE MARKS
4	(a) Dentine;	[1]
	(b) Blood (named example)/nerve (neurone);	[1]
	(c) (Bacteria) use/respire/break down sugars from food; Produce acid which corrodes the enamel;	[2]
	(d) Enamel;	[1]
	(e) Lack of freedom of choice/excess can cause fluorosis;	[1]
		6
5	(a) A – Lens;	[1]
	B – cornea;	[1]
	C – retina;	[1]
	(b) Optic nerve; carries impulses to brain ;	[2]
	(c) Pupil dilated;	[1]
	(d) Eyelid/conjunctiva eye socket;	[1]
		7
6	(a) To kill any harmful bacteria/microorganisms;	[1]
	(b) (Starter) bacteria killed by heating;	[1]
	(c) Any three from: respiration; fermentation/anaerobic; feed on sugar; produces acid; multiply/grow;	[3]
	Quality of written communication	[2]
	(d) slows microorganism growth/decay of yoghurt;	[1]
		8
7	(a) A – (waxy) cuticle;	[1]
	B – Spongy (mesophyll);	[1]
	C – Guard cell;	[1]
	(b) Large number of chloroplasts/neatly aligned/near top of leaf; to trap light/for photosynthesis;	[2]
		5

		AVAILABLE MARKS
8	(a) Fewer trees cut down/more trees left standing/more trees to absorb CO ₂ ;	[1]
	Less (waste paper) to landfill/less space used for landfill;	[1]
	(b) Any TWO from: Increased use of (fossil) fuel/named example; Increased production of CO ₂ /SO ₂ /NO _x ; Increased greenhouse effect/global/warming/acid rain;	[2]
	(c) Poor quality/more expensive;	[1]
9	(a) Inhaling; chemicals eg. glue;	[2]
	(b) Any TWO from: Heart damage; Damage to liver/bone marrow/kidneys; Damage to respiratory system/swelling of throat or air passages; Poisonous/toxic; Death; Damage to brain/blurred vision;	[2]
	(c) Any TWO from: increased medical costs; family problems/violence; vandalism; absenteeism;	[2]
10	(a) Plasma; forced out/under pressure; through capillary wall;	[3]
	(b) Blood cells;	[1]
	(plasma) proteins;	[1]
	(c) Absorb/drain away (excess) tissue fluid;	[1]
11	(a) plant grows ; towards light/window;	[2]
	(b) phototropism; more photosynthesis/ more light;	[2]
	(c) Any TWO from: selective weedkiller; rooting powder; Stimulate flowering; fruit formation/seedless fruit; fruit ripening;	[2]
		5
		6
		6

		AVAILABLE MARKS	
15	(a) (i) Abnormal cell division; capable of spreading;	[2]	
	(ii) Prevents cell division/DNA replication;	[1]	
	(iii) Smaller tumour easier to remove/causes less pain;	[1]	
	(iv) Radiation more concentrated on tumour/ less damage to healthy tissue;	[1]	
	(b) (i) Ultra violet/UV;	[1]	
	(ii) Any TWO from: CFCs; from aerosols/refrigerators/air conditioning; depletes ozone; so more UV enters;	[2]	8
16	(a) increase the number of eggs; maturing at once;	[2]	
	(b) via a needle <u>from the ovary</u> ;	[1]	
	(c) to check for fertilization; cells dividing/developing/growing/alive;	[2]	
	(d) implantation;	[1]	
	(e) Any TWO from: blocked oviducts; not ovulating; Uterus removed;	[2]	8
17	(a) Different forms of the same gene;	[1]	
	(b) The appearance of the organism;	[1]	
	(c) Hornless; Hornless allele is dominant/heterozygous genotype has one dominant and one recessive allele/Hh;	[1] [1]	
	(d) Mate with horned bull /homozygous recessive;	[1]	
	If any horned calves then cow is heterozygous/Hh;	[1]	
	If no horned calves/all hornless then cow is homozygous hornless/HH;	[1] [1]	
	(e) Backcross/testcross;	[1]	
	(f) Fertilization is random/only 50% chance of Hh;	[1]	9

18 (a) Reduced activity; Enzyme <u>denatured</u> ;	[1]	AVAILABLE MARKS
	[1]	
(b) Mouth/pancreas/duodenum/small intestine;	[1]	
(c) A protein; Catalyses/speeds up reactions; Breaking down proteins (to amino acids);	[1]	
	[1]	
	[1]	
(d) Stomach; Highest activity/optimum at pH 3;	[1]	
	[1]	
(e) Temperature/substrate concentration/substrate surface area;	[1]	9
Total		120