

Mark Scheme (Results) January 2011

GCE O

O Level Biology (7040) Paper 02

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7040/02 O-LEVEL BIOLOGY MARK SCHEME - JANUARY 2011

SECTION A

Question number	Answer	Marks
1 (a)	large surface area; chlorophyll / chloroplasts; float on surface; no overlapping / eq;	2
(b)	exposed to air / not blocked by water; gas exchange / diffusion; carbon dioxide; photosynthesis;	2
(c)	eats plants / eq;	1
(d) (i)	(random) movement of molecules / particles / ions; high conc. to low conc. / down conc. gradient / eq;	2
(ii)	kinetic energy / more molecular movement; increases diffusion / eq;	2
(e) (i)	petals / flower / blooms; pollen;	2
(ii)	variation / eq;	1

Total 12 marks

Question number	Answer	Marks
2 (a)	accept answers between 1.40 and 1.43;	1
(b) (i)	accept answer between 1000 and 1300;	1
(b) (ii)	reference to shape / tall and thin / short and fat; have different structure / components / materials / eq; eg horns / fat deposits / bone density / muscle / etc	2
(c) (i)	plants - rhinos - insects - birds; correct arrows;	2
(c) (ii)	glucose / carbohydrate; fatty acids / fat/lipid; amino acids / protein;	2
(d)	loss of forest / habitat; less food; hunting / predation / eq; less reproduction; disease / eq;	Max 2

Total 10 marks

Question number	Answer	Marks
3 (a)	keep all beakers in same air temperature; stir water / eq; use different thermometer in each beaker; leave thermometer in water when reading; use (accurate) stop watch / eq; avoid parallax error;	1
(b)	scale linear; lines straight and neat; axes correct way; axes labelled temp. + °C and time + minutes; points; key;	6
(c)	larger the beaker the slower the heat loss /eq; larger beaker has smaller SA:VOL / ref SA:VOL	2
(d)	lose <u>more</u> heat; greater SA:VOL; respiration;	Max 2
(e)	insulated beaker and non-insulated beaker; fur / feathers / eq; same size beakers; same starting temperature; same volume of water;	Max 3

Total 14 marks

Question number	Answer	Marks
4	C + and – water / range of water content / eq; O same species / type / eq; R repeat / many plants / many plots / seeds / eq; M 1 measure height / length / mass; M 2 same time stated; S 1 and S2 same temp. / ions / fertiliser / light / eq;;	Max 6

Total 6 marks

Question number	Answer	Marks
5 (a) (i)	15;	1
	(ii) 25 ticked;	1
	(iii) sample A; fewer white blood cells;	2
(b) (i)	P – cytoplasm; Q – cell wall;	2
	(ii) pathogen / pathogenic; accept if in a list	1

Total 7 marks

Question number	Answer	Marks
6 (a)	remove starch / destarch / eq; no photosynthesis; respiration;	2
(b)	Step 1 Kill leaf / stop reactions / destroy membrane; Step 3 Remove chlorophyll / decolorise leaf /eq;	1 1
(c) (i)	cross drawn; blue/black label;	2
(c) (ii)	light needed for photosynthesis; starch in area exposed to light / no starch in area not exposed to light;	2
(d)	leaf with little chlorophyll / not green / white; variegated leaf; draw chlorophyll pattern / cut discs from white / green / eq; starch/blue black only with chlorophyll;	3

Total 11 marks

Total Section A 60 marks

SECTION B

Question number	Answer	Marks
7 (a)	grows towards light / positive; phototropic; auxin; uneven growth / on dark side; grows away from gravity / upwards from gravity / negative; geotropic / gravitropic;	Max 4
(b)	fast(er); electrical / impulse; neurones/nerve cells; direct to target cells / specific / localised; shorter term response; all or nothing response; Allow converse	Max 4

Total 8 marks

Question number	Answer	Marks
8 (a)	temperature rises; ref to <u>optimum</u> temperature; denature enzymes / eq; kills microorganisms;	Max 3
(b)	idea of mixing / uneven distribution / eq; (less) oxygen available; (less) food/nutrients available / eq; uneven temperature / eq; slows rate of (aerobic) respiration / makes conditions anaerobic; different product / eq;	Max 3
(c)	other bacteria / fungi / microorganism / eq; (competition) for food / nutrient / oxygen / eq; contamination of product / different product / eq;	Max 2

Total 8 marks

Question number	Answer	Marks
9 (a)	large molecules into smaller molecules; named large molecule into named small molecule; insoluble to soluble; pass through membranes/cells/wall / into blood / into villi; enzyme / named enzyme;	Max 4
(b)	(stomach:) protease / pepsin / rennin; hydrochloric acid / acidic / low pH / pH 2 to 3; (small intestine:) pancreas enzymes / amylase / protease/trypsin / lipase / maltase / sucrase / peptidase; bile / acid neutralised / alkaline / less acidic / pH 7 to 8; <u>optimum</u> pH; ONCE	Max 4

Total 8 marks

Total Section B 16 marks

SECTION C

Question number	Answer	Marks
10	<p>explants / small pieces of plant; <u>in vitro</u>; nutrient media / eq; callus; sterile; large numbers; fast production; all year production / eq; (genetically) identical; ONCE desired characteristic; ONCE suitable example;</p> <p>(diploid) nucleus; from adult / body cell / udder cell; egg cell; enucleated / removal of nucleus / eq; electricity / shock / eq; embryo; uterus / womb; <u>surrogate</u> mother ; suitable example;</p>	<p>Max 12</p>

Total marks 12

Question number	Answer	Marks
11	<p>water; <u>root hair</u> (cells); large surface area; osmosis; dilute to concentrated solution / eq;</p> <p>mineral ions / named mineral ion / eq; diffusion; high conc. to low conc. / eq; active uptake; low conc. to high conc. / eq; energy / ATP;</p> <p>carbon dioxide; stomata;</p> <p>xylem; dead cells / hollow tube / eq; (up) stem; (to) leaves / eq; transpiration / evaporation;</p> <p>phloem; sucrose; living / sieve plates / sieve tubes / companion cells; (up and) down stem / both directions; to roots / growing points / eq;</p>	<p>Max 12</p>

Total marks 12

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