

Mark Scheme (Results)

June 2011

IGCSE Biology (4BI0) Paper 2B

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

IGCSE BIOLOGY 4BIO/2B – SUMMER 2011

Question number	Answer	Marks
1 (a)	aorta; pulmonary artery;	2
(b)	easier to change / replace / recharge / leakage / eq; ignore electric shock	1
(c)	(more) oxygen / oxygenated; (less) carbon dioxide; high(er) pressure; ignore colour	2
(d)	oxygen / glucose; respiration / energy / eq; <u>muscles</u> ;	Max 2
(e)	shortage of hearts available / unwilling / few donors / eq; no tissue match / compatability / rejection / wrong blood group / eq; ignore cost / health / age issues	1
(f)	<u>in</u> ventricle; ignore between	1
(g)	small / eq; silent / quiet / less noise / eq; permanent / no need to replace / eq; light / eq;	Max 2

Total 11 Marks

Question number	Answer	Marks
2 (a)	A conjunctiva; B lens; C ciliary muscle / ciliary body;	3
(b)	B/lens gets thick(er) / wide(r) / fat(ter) / more spherical / round(er) / <u>more</u> convex / more curved / eq; ignore smaller / bigger C/ciliary muscle contract / eq; ignore constrict	2
(c) (i)	(in bright light) <u>pupil</u> ; constricts / smaller / eq; allow converse or (in bright light) <u>iris</u> ; gets bigger / eq; allow converse or (approaching object) <u>eyelids</u> ; close / blinking; or (approaching object) <u>lens</u> ; changes shape / change described; or tear (gland); dust /eq;	Max 2
(ii)	allows less light into eye / prevent damage / eq; (converse: allows more light into eye / to see / eq;) protection; focus / see clearly / eq;	Max 1
(iii)	name of hormone; eg ADH site of production ; eg pituitary effect; eg more concentrated urine / eq	Max 3

Total 11 Marks

Hormone	Site of production	Effect
ADH	pituitary	produces concentrated urine / eq
adrenaline	adrenal	increases heart rate / eq
insulin	pancreas	converts glucose to glycogen / eq
oestrogen	ovaries	thickens uterus lining, secondary sexual characteristics
progesterone	ovaries / corpus luteum / placenta	prepares uterus lining, maintains pregnancy / eq
testosterone	testes	sperm production, secondary sexual characteristics

Question number	Answer	Marks
3 (a)	32 / -32;	1
(b)	S scales linear; L lines neat and through points; A axes correct way and labelled % and weeks; P points plotted accurately; K key; (one line no L,P and K) (bar chart only A and K)	5
(c)	(i) (both) decrease (in mass) / eq; (ii) larger mesh decrease is more / eq;	2
(d)	<u>denitrifying</u> (bacteria); (nitrates) to ammonia; (nitrates) to nitrite; (nitrates) to nitrogen (gas);	Max 2

Total 10 Marks

Question number	Answer	Marks
4 (a) (i)	20 / twenty;	1
(ii)	54 / 54.0; 10 + inside;	2
(b) (i)	<u>in</u> or <u>out</u> (of the box) / indoors or outdoors; time;	Max 1
(ii)	temperature;	1
(iii)	fair test / (increased) validity; ignore accurate / reliable (valid) comparison / eq; no other factor affected results / other factor/example affects results / only independent variable affected results / eq;	Max 2
(c)	leave thermometer in water; stir water; digital / electronic thermometer; measure to smaller temperature interval; reference to parallax / eq; measuring cylinder / eq; stopwatch / eq;	1
(d)	heat loss / cooling / eq; maintain body temperature / temperature constant / keep warm; energy used / less energy for growth / more food / eq; respiration; (more) movement;	Max 3

Total 11 Marks

Question number	Answer	Marks
5 (a)	<u>explant</u> / <u>callus</u> ; <u>small</u> pieces of plant / eq; ignore cuttings alone agar / jelly; nutrient / named nutrient / eq; sterile / eq; growth promoter / hormone / rooting powder / eq; control moisture / <u>fogging</u> greenhouse / temperature / light / CO ₂ ; clones / <u>genetically</u> identical / same DNA; quick process / eq; all year round / eq;	Max 6
(b)	gene / DNA / allele qualified; eg transfer of gene / transgenic / different gene / new gene / selected gene / desired gene / changed gene / recombinant / eq ignore modified vector / enzymes / plasmid / eq; resistance to pests / disease / drought / herbicide / increase food production / eq;	Max 3

Total 9 Marks

Question number	Answer			Marks
6 (a)	component of blood	function	cell type	4
platelet	clotting / clot; ignore scab / net / mesh / plug / eq	cell fragment		
phagocyte	engulf / ingest / destroy / kill / eq;	white		
lymphocyte	antibody / antitoxin / immune response / immunity;	white;		
(b)	less/no clotting / fibrin; blood loss / eq; entry of microorganisms / infection / eq; ignore disease			Max 2
(c)	antibody; faster/sooner antibody production / <u>faster</u> response to infection / eq; more (antibody) / eq;			Max 2

Total 8 Marks
PAPER TOTAL : 60 MARKS

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