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Mark Scheme (Results)

June 2011

International GCSE
Biology (4BI0) Paper 1B
Science Double Award (4SC0) Paper 1B

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Publications Code UG027492

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.

INTERNATIONAL GCSE BIOLOGY 4BI0/1B – SUMMER 2011

Question number	Answer	Marks
1 (a) (i)	A: palisade (cell) / mesophyll / vacuole; R spongy B: guard cell;	2
(ii)	reduce water loss/transpiration/evaporation; prevent entry of microorganisms; Ignore waterproof	1
(iii)	carbon dioxide + water; glucose + oxygen; allow correct chemical formula	2
(iv)	diffusion / diffuses; stomata / pores / holes; concentration gradient / eq;	2
(b)	reduce water loss; less light; less photosynthesis; conserve energy / eq;	Max 2
(c)	named organ and substance: lungs + carbon dioxide / water kidney + urea / urine / water / salts / eq skin + sweat / water / salts / urea / eq liver + bile;;	2

Total 11 Marks

Question number	Answer	Marks
2 (a)	A: stigma; B: anther; R antler	2
(b)	transfer of pollen (by insect); from anther/stamen to stigma;	2
(c)	petals/flower smaller / less bright / less attractive /eq; stamens/anthers outside flower / exposed / larger /eq; style/stigma outside flower / exposed / larger / eq; stigma feathery / eq; no nectary; Ignore ref. to pollen/scent/nectar	Max 2
(d)	germinates; (pollen) tube; (grows down) style; digestion / enzymes; (enters) ovule; ovary; micropyle; (male) nucleus / (pollen grain) nucleus / male gamete; fertilisation / fuse / join / eq; ovum / egg / nucleus / female gamete; ovule becomes seed; ovule wall becomes seed coat / testa; ovary becomes fruit; allow if labelled on diagram	Max 6

Total 12 Marks

Question number	Answer	Marks
3 (a)	pressure; vena cava; ventricle; pulmonary; artery; capillaries; bacteria;	7

Total 7 Marks

Question number	Answer	Marks
4 (a) (i)	greenfly and blue tit in correct order; secondary consumer; producer;	3
(ii)	bacteria / fungi;	1
(b)	three; allow decomposition, respiration and combustion	1

Total 5 Marks

Question number	Answer	Marks
5 (a) (i)	pork;	1
(ii)	210;; allow one mark for 21 however expressed	2
(b)	pork;	1
(c)	energy; Ignore food store protection / padding / eq; insulation / prevent heat loss / keep warm / eq; cell membranes; myelin sheath;	Max 2
(d)	Iron / Fe; R ion	1

Total 7 Marks

Question number	Answer	Marks
6 (a) (i)	only expressed if homozygous / only expressed if both alleles recessive / only expressed if homozygous recessive / hidden/not expressed / eq; Ignore not dominant/weaker/overpowered	1
(ii)	DD / homozygous dominant; Dd / heterozygous;	2
(b) (i)	Dd <u>and</u> Dd; DD and Dd and Dd and dd in any order; allow if different symbols but not X and Y	2
(ii)	75% / ¾ / 0.75 / eq; allow 3 out of 4 / 3 in 4	1
(iii)	3:1 / 1:3;	1
(c)	less blood; (less) glucose; (less) oxygen; (less) (aerobic) respiration / more <u>anaerobic</u> respiration; lactic acid; increase in rate / heart works harder; increase in pressure; coronary artery; angina; <u>clot</u>; death / heart disease / heart attack / eq;	Max 5

Total 12 Marks

Question number	Answer	Marks
7 (a) (i)		2

Distance pins apart			
Area	0.5 cm	1.0 cm	2.0 cm
Finger tips	√ √ √ √ X √ √ √ X X	√ √ √ √ √ √ X √ √ X	√ √ √ √ √ √ √ √ √ √
Percentage correct	70	(80)	(100)
Back of hand	√ X √ √ X X X X √ X	√ √ X √ X √ X √ √ X	√ √ √ √ √ √ X √ X √
Percentage correct	(40)	60	(80)
Wrist	X X X √ X X X X X X	√ X √ X √ √ X √ √ X	X √ X √ √ X √ √ √ √
Percentage correct	10	(60)	70;;

3 or 4 correct = 2
1 or 2 correct =1

Question number	Answer	Marks
7 (b)	S size at least half grid; A1 axis labelled %/percentage (correct); A2 axis with % correct linear; K1 finger, hand and wrist / F,H and W; K2 0.5, 1, and 2;	5
(c)	finger tips; more correct answers / most success / eq; at each distance apart / at 0.5 apart;	3
(d)	nerve endings / receptors / nerves / neurones / eq; more / closer together / closer to skin surface / eq; skin thickness; used for touch / to feel / use of fingers / eq;	2
(e)	fair test / easier or harder to detect / valid (comparison) / eq; Ignore control / reliable / accurate;	1

Total 13 Marks

Question number	Answer	Marks
8 (a) (i)	oxygen; respiration / energy; active uptake;	Max 2
(ii)	no light / keep dark; roots; (no) photosynthesis; (growth) water plants / algae;	Max 2
(b) (i)	any answer in the range 105 to 125; any answer in the range 80 to 95;	2
(ii)	repeat / eq;	1
(iii)	temperature; light; carbon dioxide; humidity; volume of solution / liquid; Ignore water ion concentration;	Max 2
(c)	(nitrates) soluble / dissolve; rain / water / run off; leaching / leached; algal growth / plant growth / algal bloom / eq; block light / sun / eq; plants die / less photosynthesis / eq; less oxygen / anoxic / eq; bacteria / fungi; decomposers / decomposition / rot / decay / eq; respiration; fish / animals die; eutrophication;	Max 6

Total 15 Marks

Question number	Answer	Marks
9 (a)	less surface; fewer / no stomata; (less) transpiration / evaporation / diffusion;	Max 2
(b)	obtain water; more area / eq; water at surface / before water evaporates / before water seeps into soil / eq; allow rain / dew	Max 2
(c)	less chance of being eaten/protection from animals /eq; allow if predator maintain still air / eq;	Max 1

Total 5 Marks

Question number	Answer	Marks
10 (a) (i)	humans / farmers (select organisms) / eq; desired features / characteristics / named feature / eq; mate / breed / reproduce / cross / AI / eq; repeat / several generations / select offspring / eq;	4
(ii)	short stem / eq; wheat / eq;	2
(b)	humans not involved / animals choose / eq; 'fittest' survive / best adapted / competition / eq; more generations involved / slower process; role of chance / random / mutation / eq; speciation / evolution / eq;	Max 2

Total 8 Marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Marks</th></tr>
<tr><td>11 (a)</td><td>C H O only / carbon, hydrogen and oxygen only;</td><td>1</td></tr>
<tr><td>(b)</td><td>
<table>
<tr><td>Carbohydrate</td><td>Soluble</td><td>Found in animal cells</td><td>Broken down by amylase</td><td>Small molecule</td><td>Absorbed in the stomach</td></tr>
<tr><td>Starch</td><td>X</td><td>X</td><td>√</td><td>X</td><td>X</td></tr>
<tr><td>Glucose</td><td>√;</td><td>√;</td><td>X;</td><td>√;</td><td>X;</td></tr>
</table>
A tick cross = zero</td><td>5</td></tr>
<tr><td>(c) (i)</td><td>Benedicts / eq;
heat / water bath;
red / orange / yellow / green / eq;</td><td>3</td></tr>
<tr><td>(ii)</td><td>water bath / avoid direct heat / point away / eq;
goggles / lab coat / tongs / tie hair / tuck tie away / gloves;</td><td>2</td></tr>
</table>

Total 11 Marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Marks</th></tr>
<tr><td>12 (a)</td><td>
<table>
<tr><th>Characteristic</th><th>Description</th></tr>
<tr><td>nutrition</td><td>feeding / eating / nutrients / energy / eq;</td></tr>
<tr><td>respiration;</td><td>releasing energy in cells</td></tr>
<tr><td>reproduction;</td><td>producing offspring</td></tr>
<tr><td>growth and development</td><td>increase in size / more cells / cell division / eq;</td></tr>
</table>
</td><td>4</td></tr>
<tr><td>(b) (i)</td><td>cell wall / cellulose;
vacuole;
chloroplast / chlorophyll;
starch;</td><td>Max 2</td></tr>
<tr><td>(ii)</td><td>cell wall / (no) protein coat;
cell membrane;
cytoplasm / cell organelles; Ignore nucleus
plasmids / <u>only</u> DNA;
flagellum;
larger;
slime capsule;</td><td>Max2</td></tr>
</table>

Total 8 Marks

Question number	Answer	Marks
13	C vary pH / acid + alkali / eq; O same species / mass / number / concentration / amount of yeast / eq; R repeat each pH / eq; M1 mass / number / bubbles / carbon dioxide / alcohol / eq; M2 time period stated; S1 and S2 same temp / volume of water / same nutrients / conc. of nutrients / oxygen / eq;; Ignore light	Max 6

Total 6 Marks

PAPER TOTAL: 120 MARKS

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