

Mark Scheme (Results)

June 2011

International GCSE

Biology (4BI0) Paper 1B

Science Double Award (4SC0) Paper 1B

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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.

| Question number | Answer | Marks |
|-----------------|--|-------|
| 2 (a) | A: <u>stigma</u> ; B: <u>anther</u> ; 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 <u>nectary</u> ; Ignore ref. to pollen/scent/nectar | Max 2 |
| (d) | germinates; (pollen) tube; (grows down) style; <u>digestion</u> / <u>enzymes</u> ; (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 <u>and</u> 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% / $\frac{3}{4}$ / 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) | Distance pins apart | | | 2 | |
| | 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; <u>leaching / leached</u> ; 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; <u>eutrophication</u> ; | Max 6 |

Total 15 Marks

| Question number | Answer | Marks |
|-----------------|---|-------|
| 9 (a) | less surface; fewer / no <u>stomata</u> ; (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

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

Total 11 Marks

| Question number | Answer | Marks | | | | | | | | | | |
|------------------------|--|----------------|-------------|-----------|--|---------------------|---------------------------|----------------------|---------------------|------------------------|--|---|
| 12 (a) | <table border="1"> <thead> <tr> <th>Characteristic</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table> | Characteristic | Description | nutrition | feeding / eating / nutrients / energy / eq; | respiration; | releasing energy in cells | reproduction; | producing offspring | growth and development | increase in size / more cells / cell division / eq; | 4 |
| Characteristic | Description | | | | | | | | | | | |
| nutrition | feeding / eating / nutrients / energy / eq; | | | | | | | | | | | |
| respiration; | releasing energy in cells | | | | | | | | | | | |
| reproduction; | producing offspring | | | | | | | | | | | |
| growth and development | increase in size / more cells / cell division / eq; | | | | | | | | | | | |
| (b) (i) | cell wall / cellulose; vacuole; chloroplast / chlorophyll; starch; | Max 2 | | | | | | | | | | |
| (ii) | cell wall / (no) protein coat; cell membrane; cytoplasm / cell organelles; Ignore nucleus plasmids / <u>only</u> DNA; flagellum; larger; slime capsule; | Max2 | | | | | | | | | | |

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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Llywodraeth Cynulliad Cymru
Welsh Assembly Government

