

Biology B

General Certificate of Secondary Education

Unit **B631/01**: Modules B1, B2, B3 (Foundation Tier)

Mark Scheme for June 2011

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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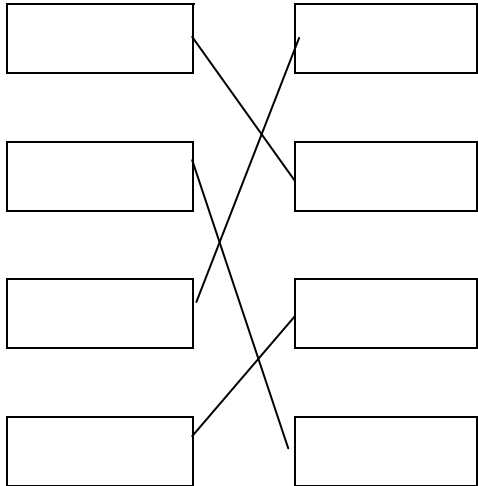
- 1 The **Abbreviations, annotations and conventions** used in the detailed Mark Scheme are:

| | |
|---------------|---|
| / | = alternative and acceptable answers for the same marking point |
| (1) | = separates marking points |
| not | = answers which are not worthy of credit |
| reject | = answers which are not worthy of credit |
| ignore | = statements which are irrelevant |
| allow | = answers that can be accepted |
| () | = words which are not essential to gain credit |
| — | = underlined words must be present in answer to score a mark |
| ecf | = error carried forward |
| AW | = alternative wording |
| ora | = or reverse argument |

| Question | | | Expected Answers | Marks | Additional Guidance |
|--------------|---|----|--|----------|---|
| 1 | a | i | a chemical in the air and nose (1) | 1 | more than one line is zero |
| | | ii | happens quickly (1) do not have to think about it (1) | 2 | ignore happens almost immediately (already in stem of question) allow idea of it being an automatic response (1) allow reference to idea of protection (1) |
| | b | i | (in the) nucleus (1) | 1 | allow on the chromosomes / in the DNA |
| | | ii | red-green colour blindness / sickle cell anaemia / cystic fibrosis (1) | 1 | allow any correct answer eg Down's syndrome / deafness ignore cancer unless specified eg breast cancer |
| Total | | | | 5 | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|--------------|---|----|--|----------|--|
| 2 | a | i | develop cravings for it / dependant on it / suffer withdrawal effects without it (1) | 1 | allow implication of dependency |
| | | ii | emphysema / bronchitis / cancer / heart disease (1) | 1 | allow any correct answer |
| | b | i | 25 (1) | 1 | |
| | | ii | the higher the number of cigarettes smoked the smaller the birth weight / mass / ora (1) idea of considerable variation / scattering of results (1) | 2 | allow negative correlation / inversely proportional (1) |
| Total | | | | 5 | |

| Question | | Expected Answers | Marks | Additional Guidance |
|----------|---|--|----------|---|
| 3 | a | breakfast (1) | 1 | |
| | b | fat (1) | 1 | |
| | c | RDA is 39(g) (1) diet gives her 45(g) (1) | 2 | allow diet gives 6(g) more than RDA (2) if give 39 and 45 (1) |
| | | Total | 4 | |

| Question | | Expected Answers | Marks | Additional Guidance |
|----------|---|---|----------|--|
| 4 | a |  | 2 | four correct = 2 marks two / three correct = 1 mark one correct = zero more than 4 lines deduct 1 mark for each extra line (min zero) |
| | b | measure pulse at rest then do some exercise (1) see how long it takes for pulse to return to normal (1) | 2 | |
| | c | i | 1 | allow artery |
| | | ii | 1 | not blood pressure on its own / muscle contraction ignore valves |
| | | Total | 6 | |

| Question | | Expected Answers | Marks | Additional Guidance |
|----------|---|---|----------|--|
| 5 | a | predators (1) habitat (1) community (1) | 3 | |
| | b | fish / amphibian / reptile / bird (1) | 1 | ignore named examples |
| | c | idea of fish quota (1) | 1 | allow reduce pollution in sea / water allow protect habitat / fewer trawlers / fewer fishing boats / larger holes in net / fish farms / exclusion zones / return smaller fish / reduce fishing season / fish somewhere else / captive breeding / catch alternative species ignore ban fishing ignore just 'breed' BUT allow breeding programme |
| | | Total | 5 | |

| Question | | Expected Answers | Marks | Additional Guidance |
|----------|---|--|----------|--|
| 6 | a | 3.0 (2) but if answer is incorrect total = 24 or incorrect total \div 8 (1) | 2 | allow 3 (2) allow if nothing written on answer lines look in table |
| | b | any two from: idea of dog whelks most abundant where their food source is (1) idea of desiccation on upper shore (1) more predators on upper shore (1) | 2 | eg the dog whelks will be where their food is (1) eg they dry out because uncovered longer (1) ignore just it's wetter nearer the sea (ie need consequence for whelks) ignore human impact ignore pollution |
| | c | mate / space / shelter (1) | 1 | ignore habitat / land idea |
| | | Total | 5 | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|--------------|---|-----|--|----------|--|
| 7 | a | i | photosynthesis (1) | 1 | |
| | a | ii | chlorophyll (1) | 1 | allow correct answer underlined, circled or ticked if answer line is blank. |
| | a | iii | oxygen (1) | 1 | allow O ₂ not O |
| | b | | preserved in amber / peat bog / tar pits / ice (1) | 1 | allow glaciers / tree sap / frozen ignore casts / impressions / desiccated ignore swamps ignore description of conditions e.g. lack of oxygen / microbes ignore implication that humans responsible e.g. put in freezer / mummify |
| Total | | | | 4 | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|--------------|---|----|---|----------|---|
| 8 | a | | any three from: camouflage (1) hide from predator (1) built for speed / streamlined (1) escape predator (1) live in groups (1) less chance of getting caught (1) idea of stings or poison (1) as defence (1) | 3 | allow three descriptions allow one description (1) and an associated explanation (1) not explanation marks on their own without being associated allow being nocturnal (1) avoid predators (1) allow better hearing / sense of smell (1) avoid predators (1) allow migrate (1) to escape predators (1) allow mimicry / warning colours/scent (1) put predators off eating them (1) allow warning signals (1) to protect the whole group (1) allow reference to Narwhal tusk (1) as defence (1) |
| | b | i | not many left / in danger of dying out / in danger of going extinct (1) | 1 | ignore decreasing numbers / population going down ignore they are dying or being killed ignore in danger unless qualified |
| | b | ii | squirrel / kite (1) habitat (1) | 2 | allow environment / homes / nests / food supply (1) |
| Total | | | | 6 | |

| Question | | Expected Answers | Marks | Additional Guidance |
|--------------|-------------|--|----------|--|
| 9 | a | 1 infancy 2 childhood 3 adolescence 4 maturity 5 old age | 2 | all in correct order (2) a run of 3 in correct order (1) otherwise (0) |
| | b i | 14 (months) (1) | 1 | allow +/- half a month |
| | b ii | 11.1(%) (2) BUT $\frac{5}{45} \times 100$ (1) | 2 | allow 11 (2) |
| | c i | a change to a gene (1) | 1 | allow change to DNA/genetic material / chromosome (1) |
| | c ii | radiation / chemicals / spontaneous (1) | 1 | allow mutagen allow higher level responses: ionising radiation / UV / X ray / gamma / correct carcinogens e.g. tar / cigarette smoke (1) ignore 'drugs' |
| Total | | | 7 | |

| Question | | Expected Answers | Marks | Additional Guidance |
|--------------|------------|--|----------|---|
| 10 | a i | control movement of substances in and out of the cell (1) | 1 | allow idea of things passing in and out of the cell (1) ignore acts as a barrier |
| | ii | cytoplasm (1) | 1 | |
| | iii | diffusion | 1 | allow higher level descriptions of diffusion |
| | b | small size for swimming (1) tail for swimming (1) streamlined shape for mobility (1) nucleus to carry the genes (1) large numbers increase chance of fertilisation (1) | 3 | allow tiny so less energy needed (to move)/allows for large numbers (1) allow tail for mobility (1) allow shape lets them penetrate egg membrane (1) not shape lets them penetrate egg wall allow acrosome / enzymes in tip to penetrate egg membrane (1) allow many mitochondria to provide energy (1) allow little cytoplasm hence reduced mass (1) |
| Total | | | 6 | |

| Question | | Expected Answers | Marks | Additional Guidance | |
|----------|---|--|---------------------------------------|---|--|
| 11 | a | cut the stem at an angle 2 | 2 | must start with choose a stem ... = (1) next 2 steps in correct order = (1) all 3 correct (2) | |
| | | put the cutting in a warm place 3 | | | |
| | | choose a stem with bud 1 | | | |
| | b | any one from: be sure of characteristics (1) can mass produce if seeds difficult to cultivate (1) | 1 | allow will always get the same colour flower allow you know what you will get ignore just they're the same allow genetically identical allow can still grow them if seeds difficult to grow ignore cost allow it's quick(er) | |
| | c | (plant) hormones (1) | 1 | allow higher level responses auxins, IAA etc. ignore nutrients / minerals | |
| | d | i | leaf / leaves (1) | 1 | |
| | d | ii | (by) evaporation (1) diffusion (1) | 1 | allow higher level transpiration responses(1) |
| | e | cell division (1) | 1 | allow higher level mitosis responses (1) | |
| | | Total | 7 | | |

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