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# Mark Scheme (Results)

## June 2022

Pearson BTEC Nationals
In Animal Management (31645H)
Unit 2: Animal Biology

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## Unit 2: Animal Biology

### 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.
- All marks on the mark scheme should be used appropriately.
- All 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 a 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 about applying 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.
- Phonetic spelling should be accepted.

| Question Number | Answer | Mark |
|---|---|---|
| 1a | Kingdom<br>Phylum<br>Class<br>Order<br>Family<br>Genus<br>Species<br><br>Accept answers in any order. | 2 |

| Question Number | Answer | Mark |
|---|---|---|
| 1b | Atrium / Ventricle (1) | 1 |

| Question Number | Answer | Mark |
|---|---|---|
| 1c | Award **one** mark for each correct row to a maximum of **four** marks.<br><br>Name of tissue type / Function<br>Epithelial / Lines body surfaces / involved in absorption / secretion / protection (1)<br>Connective / Supports body parts / structure / binding together/ transporting substances / insulation (1)<br>Nervous (1) / Conducts impulses<br>Muscle (1) / Allows movement<br><br>Accept any other appropriate wording.<br><br>Do not accept 'connects' alone as a function for connective tissue. | 4 |

| Question Number | Answer | Mark |
|---|---|---|
| 2a | Award **one** mark for each bone identified correctly up to a maximum of **three** marks.<br><br>A – Ribs (1)<br>B – Femur (1)<br>C – Scapula (1) | 3 |

| Question Number | Answer | Mark |
|---|---|---|
| 2b | Award up to **two** marks for a description that makes reference to the following:<br><br>• Tough / flexible / fibrous tissue (1) which connects two bones / bone to bone (1) to form a joint / hold in place (1)<br><br>Accept any other relevant phrasing/wording. | 2 |

| Question Number | Answer | Mark |
|---|---|---|
| 2c | Award **one** mark for each correct function up to a total of **two** marks.<br><br>• Elastic (1)<br>• Waterproof (1)<br>• Gives colour (1)<br>• Barrier (1)<br><br>Accept any other appropriate response. | 2 |

| Question Number | Answer | Mark |
|---|---|---|
| 2d | Award **one** mark for identification and **one** additional mark for appropriate expansion up to a maximum of **four** marks.<br><br>Down<br>• Insulation (1) by trapping air (1)<br><br>Filoplume<br>• Sensory / nerve endings (1) to send information to brain (1)<br><br>Accept any other relevant phrasing/wording. | 4 |

| Question Number | Answer | Mark |
|---|---|---|
| 3a | Award **one** mark for each organelle identified correctly up to a maximum of **three** marks.<br><br>A. Rough endoplasmic reticulum (1)<br>B. Lysosome (1)<br>C. Golgi apparatus (1) | 3 |

| Question Number | Answer | Mark |
|---|---|---|
| 3b | Award up to **four** marks for a description that makes reference to the following:<br><br>• A bilayer / two layers (1)<br>• Molecules / phospholipids (1)<br>• Hydrophilic / water loving head (1)<br>• Hydrophobic / repels water tail (1)<br>• Glycolipid (1)<br>• Glycoproteins (1)<br>• Carbohydrate chains (1)<br>• Cholesterol (1)<br>• Integral / peripheral proteins (1)<br><br>Accept any other relevant phrasing/wording. | 4 |

| Question Number | Answer | Mark |
|---|---|---|
| 3c | Award up to **two** marks for a description that makes reference to the following:<br><br>• Eukaryotic cells are found in animals (1)<br>• Prokaryotic cells form bacteria (1)<br>• Eukaryotic cell has a nucleus (1)<br>• Prokaryotic cell has no 'membrane bound' nucleus (1)<br><br>Accept any other relevant phrasing/wording. | 2 |

| Question Number | Answer | Mark |
|---|---|---|
| 3d | Award up to **three** marks for a description that makes reference to the following:<br><br>• Movement of substances / oxygen (1)<br>• From a high concentration to a low concentration / across a concentration gradient(1)<br>• No energy involved (1)<br>• In and out of cells (1)<br><br>Accept any other relevant phrasing/wording. | 3 |

| Question Number | Answer | Mark |
|---|---|---|
| 4a | Vasoconstriction (1) | 1 |

| Question Number | Answer | Mark |
|---|---|---|
| 4b | Award up to **four** marks for a description that makes reference to the following:<br><br>• Heat is exchanged across blood vessels passing in opposite directions (1)<br>• Arteries carry warm / oxygenated blood away from the heart (1)<br>• Veins carry cold / oxygenated blood to the heart (1)<br>• Heat is transferred from the warm arterial blood to the cooler venous blood (1)<br>• Body temperature is balanced (1)<br><br>Accept any other relevant phrasing/wording. | 4 |

| Question Number | Answer | Mark |
|---|---|---|
| 4c | Sympathetic nervous system (1) | 1 |

| Question Number | Answer | Mark |
|---|---|---|
| 4d | Award **one** mark for identification and **one** additional mark for appropriate expansion up to a maximum of **two** marks.<br><br>• Storage of fat (1) to break down when needed to generate heat (1)<br>• Contains lipids (1) used for thermoregulation in newborns (1)<br>• Energy store (1) for hibernating animals (1)<br><br>Accept any other appropriate answer and relevant animal examples. | 2 |

| Question Number | Answer | Mark |
|---|---|---|
| 4e | Award **one** mark for each identification and **one** additional mark for an appropriate expansion up to a total of **four** marks.<br><br>Endothermic<br>• Animals that control their own body temperature (1) because they are warm blooded / generate their own heat within their body (1)<br><br>Ectothermic<br>• Animals that cannot control their own body temperature (1) because they are cold blooded / because they rely on external heat sources (1)<br><br>Accept any other relevant phrasing/wording. | 4 |

| Question Number | Answer | Mark |
|---|---|---|
| 5a | 30–32 days / 1 month (1) | 1 |

| Question Number | Answer | Mark |
|---|---|---|
| 5b | Award **one** mark for identification and **one** additional mark for appropriate expansion up to a maximum of **four** marks.<br><br>1. Oestrogen (1) results in ovulation production of eggs / ova (1)<br>2. Progesterone (1) thickens the lining of the uterus (1)<br><br>Accept any other relevant phrasing/wording. | 4 |

| Question Number | Answer | Mark |
|---|---|---|
| 5c | Award up to **two** marks for a description that makes reference to the following:<br><br>• An organ connecting the foetus to the uterine wall (1)<br>• Composed of maternal tissue and tissue from the embryo (1)<br>• The chorion / composed of foetal blood vessels (1)<br>• Provides nourishment / life functions to foetus (1)<br><br>Accept any other valid response. | 2 |

| Question Number | Indicative content | Mark |
|---|---|---|
| 5d | Responses may include the following:<br><br>• Impulse releases calcium<br>• Myosin molecule attaches to a binding site on actin filament and $Ca^{2+}$ binds to troponin<br>• A cross bridge forms<br>• Myosin pulls actin filament and ADP and P are released and cause power stroke<br>• An ATP molecule attaches to the myosin head and breaks the cross bridge<br>• Myosin moves back and ATP is hydrolysed to ADP and P to allow another cross bridge to form and the cycle to continue.<br><br>Accept any other valid response. | 8 |
| **Level** | **Descriptor** | **Marks** |
| Level 0 | No rewardable material. | 0 |
| Level 1 | • Demonstrates isolated elements of knowledge and understanding, there will be major gaps or omissions.<br>• Few of the points made will be relevant to the context in the question.<br>• Limited discussion which contains generic assertions rather than considering different aspects and the relationship between them. | 1-3 |
| Level 2 | • Demonstrates some accurate knowledge and understanding, with only minor gaps or omissions.<br>• Some of the points made will be relevant to the context in the question, but the link will not always be clear.<br>• Displays a partially developed discussion which considers some different aspects and some consideration of how they interrelate, but not always in a sustained way. | 4-6 |
| Level 3 | • Demonstrates mostly accurate and detailed knowledge and understanding.<br>• Most of the points made will be relevant to the context in the question, and there will be clear links.<br>• Displays a well-developed and logical discussion which clearly considers a range of different aspects and considers how they interrelate, in a sustained way. | 7-8 |

| Question Number | Answer | Mark |
|---|---|---|
| 5e | Award up to a maximum of **four** marks.<br><br>• Ovary (1)<br>• Infundibulum (1)<br>• Oviduct (1)<br>• Magnum (1)<br>• Isthmus (1)<br>• Uterus (1)<br>• Cloaca (1) | 4 |

| Question Number | Answer | Mark |
|---|---|---|
| 6a | Award **one** mark for identification and **one** additional mark for appropriate expansion up to a maximum of **four** marks.<br><br>• Birds do not have a bladder (1) as they do not produce urine (1)<br>• Birds have a cloaca (1) birds excrete uric acid / faeces combined (1)<br>• Mammals have a urethra (1) to release urine from the bladder (1)<br><br>Accept the reverse arguments. | 4 |

| Question Number | Answer | Mark |
|---|---|---|
| 6b | Award up to a maximum of **one** mark.<br><br>• Excessive urination / difficulty urinating (1)<br>• Discoloured urine / blood in urine / foul smelling urine (1)<br>• Excessive thirst (1)<br>• Fluid / pain in abdomen (1)<br><br>Accept any other relevant phrasing/wording.<br><br>Do not accept fatigue / weakness / lethargy / loss of appetite / vomiting. | 1 |

| Question Number | Answer | Mark |
|---|---|---|
| 6c | Award **one** mark for identification and **one** additional mark for appropriate expansion up to a maximum of **four** marks.<br><br>• Osmoregulation (1) by controlling the body's water content (1)<br>• Ultrafiltration (1) by removing substances from the blood (1)<br>• Regulate arterial blood pressure (1) by excreting sodium and water(1)<br>• Excrete waste products (1) by producing urine (1)<br>• Stimulate production of red blood cells (1) by producing the hormone erythropoietin (1)<br>• Regulate vitamin D production (1) by converting source of vitamin D into active forms (1)<br>• Gluconeogenesis (1) by forming glucose from the amino acids in proteins (1)<br><br>Accept any other relevant phrasing/wording. | 4 |

| Question Number | Answer | Mark |
|---|---|---|
| 6d | Award up to a maximum of **two** marks.<br><br>• Glomerulus (1)<br>• Bowman's capsule (1)<br>• Distal tubule (1)<br>• Proximal tubule (1)<br>• Loop of Henle (1)<br>• Collecting duct (1)<br>• Renal capsule (1)<br>• Renal tubule (1) | 2 |

| Question Number | Indicative content | Mark |
|---|---|---|
| 7 | Responses may include the following:<br><br>• Osmoregulation is the process of maintaining water balance in the body.<br>• The hypothalamus in the brain detects changing levels of water in the blood via osmoregulators and stimulates the pituitary gland to secrete less or more anti-diuretic hormone (ADH).<br>• A high water content results in less ADH being secreted, less water reabsorbed by the kidneys so more urine is produced and more water lost / less water into blood.<br>• A low water content results in more ADH being secreted, which causes the collecting ducts of the kidney to reabsorb more water via osmosis, less urine is produced so less water is lost / a higher volume of water into the blood.<br>• Water is also lost through the skin by sweating and panting.<br>• Illustrative animal examples may be used to expand on points given.<br><br>Accept any other valid response. | 8 |
| **Level** | **Descriptor** | **Marks** |
| Level 0 | No rewardable material. | 0 |
| Level 1 | • Demonstrates isolated elements of knowledge and understanding, there will be major gaps or omissions.<br>• Few of the points made will be relevant to the context in the question.<br>• Limited discussion which contains generic assertions rather than considering different aspects and the relationship between them. | 1-3 |
| Level 2 | • Demonstrates some accurate knowledge and understanding, with only minor gaps or omissions.<br>• Some of the points made will be relevant to the context in the question, but the link will not always be clear.<br>• Displays a partially developed discussion which considers some different aspects and some consideration of how they interrelate, but not always in a sustained way. | 4-6 |
| Level 3 | • Demonstrates mostly accurate and detailed knowledge and understanding.<br>• Most of the points made will be relevant to the context in the question, and there will be clear links.<br>• Displays a well-developed and logical discussion which clearly considers a range of different aspects and considers how they interrelate, in a sustained way. | 7-8 |