



Mark Scheme (Results)

January 2021

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

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Unit 2: Animal Biology

General marking guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Mark grids should be applied positively. Learners must be rewarded for what they have shown they can do rather than be penalised for omissions.
- Examiners should mark according to the mark grid, not according to their perception of where the grade boundaries may lie.
- All marks on the mark grid should be used appropriately.
- All the marks on the mark grid are designed to be awarded. Examiners should always award full marks if deserved. Examiners should also be prepared to award zero marks, if the learner's response is not rewardable according to the mark grid.
- Where judgement is required, a mark grid will provide the principles by which marks will be awarded.
- When examiners are in doubt regarding the application of the mark grid to a learner's response, a senior examiner should be consulted.

Specific marking guidance

The mark grids have been designed to assess learners' work holistically.

Rows in the grids identify the assessment focus/outcome being targeted. When using a mark grid, the 'best fit' approach should be used.

- Examiners should first make a holistic judgement on which band most closely matches the learner's response and place it within that band. Learners will be placed in the band that best describes their answer.
- The mark awarded within the band will be decided based on the quality of the answer in response to the assessment focus/outcome and will be modified according to how securely all bullet points are displayed at that band.
- Marks will be awarded towards the top or bottom of that band depending on how they have evidenced each of the descriptor bullet points.

Question Number	Answer	Mark
1a	Award up to a maximum of two marks. Water (1) Minerals (1)	2

Question Number	Answer	Mark
1b	Liver (1)	1

Question Number	Answer	Mark										
1c	<p>Award one mark for each correct row, up to a maximum of four marks.</p> <table border="1"> <thead> <tr> <th>Name of part of stomach</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Rumen (1)</td> <td>Process of fermentation involving bacteria and microorganisms</td> </tr> <tr> <td>Reticulum (1)</td> <td>Forms undigested food into balls of cud for regurgitation</td> </tr> <tr> <td>Omasum</td> <td>Absorbs some water and salts / acts as a type of pump/filters out large particles (1)</td> </tr> <tr> <td>Abomasum</td> <td>The true stomach where digestive enzymes and acid are added / chemical digestion (1)</td> </tr> </tbody> </table> <p>Accept any other appropriate response</p>	Name of part of stomach	Function	Rumen (1)	Process of fermentation involving bacteria and microorganisms	Reticulum (1)	Forms undigested food into balls of cud for regurgitation	Omasum	Absorbs some water and salts / acts as a type of pump/filters out large particles (1)	Abomasum	The true stomach where digestive enzymes and acid are added / chemical digestion (1)	4
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Question Number	Answer	Mark
2a	Award one mark for each structure identified correctly, up to a maximum of three marks. A – Iris (1) B – Cornea (1) C – Lens (1)	3

Question Number	Answer	Mark
2b	Award one mark for identification and one additional mark for appropriate expansion, up to a maximum of four marks. Ears <ul style="list-style-type: none"> • Detect sounds (1) to identify prey/warn of danger/find a mate (1) Whiskers <ul style="list-style-type: none"> • Sensitive to movement/touch/pressure (1) respond to prey/safety/spatial awareness (1) Accept any other relevant phrasing/wording.	4

Question Number	Answer	Mark
2c	Award one mark for identification and one additional mark for appropriate expansion, up to a maximum of two marks. <ul style="list-style-type: none"> • Side of the head (1) wider field of vision / to detect predators / to see more (1) Accept any other relevant phrasing/wording.	2

Question Number	Answer	Mark
2d	Award one mark for each component identified correctly, up to a maximum of two marks. <ul style="list-style-type: none"> • The brain (1) • The spinal cord (1) 	2

Question Number	Answer	Mark
3a	<p>Award one mark for each structure identified correctly, up to a maximum of two marks.</p> <p>A – Dendrite/s (1) B – Node of Ranvier (accept node) (1)</p>	2

Question Number	Answer	Mark
3b	<p>Award one mark for each descriptive point that makes reference to the following, up to a maximum of four marks.</p> <ul style="list-style-type: none"> • Chemical substance (1) • Released at the end of a nerve fibre / axon terminal (1) • From one nerve impulse to another / muscle fibre (1) • Diffuses across a synapse / junction (1) • Release triggered by an action potential (1) <p>Accept any other relevant phrasing/wording and one specific example, i.e. acetylcholine.</p>	4

Question Number	Answer	Mark
3c	<p>Award up to two marks for each description that makes reference to the following, up to a maximum of four marks.</p> <ul style="list-style-type: none"> • Sensory / afferent neuron (1) send impulses from sensory organs to the central nervous system (1) • Motor / efferent neuron (1) send impulses from the central nervous system to muscles / organs / to cause movement (1) • Inter / relay neurons (1) transmit impulses between sensory and motor neurons in the central nervous system /brain and spinal cord (1) <p>Accept any other relevant phrasing/wording.</p>	4

Question Number	Answer	Mark
3d	<p>Award up to two marks for a description that makes reference to the following.</p> <ul style="list-style-type: none"> • A neurological/ inherited disease (1) • Affects the spinal cord / nerves (1) • Gets ets worse with time (1) • Loss of coordination in hind limbs / wobbling at back end (1) • German Shepherds prone to the disease (1) <p>Accept any other relevant phrasing/wording.</p>	2

Question Number	Answer	Mark
4a	Trachea (1) Respiratory tract (1) Prostate (1) Vas deferens (1)	1

Question Number	Answer	Mark
4b	Award up to three marks for a description that makes reference to the following. <ul style="list-style-type: none"> • Striated / striped appearance (1) • Multinucleated / multiple nuclei (1) • Linear / not branched (1) • Cylindrical shape (1) Accept any other relevant phrasing/wording.	3

Question Number	Answer	Mark
4c	Adenosine triphosphate / ATP (1)	1

Question Number	Answer	Mark
4d	Award one mark for identification and one additional mark for appropriate expansion, up to a maximum of four marks. <ul style="list-style-type: none"> • Contract slowly (1) to work for a long time/allow animals to run long distance (1) • Red/dark colour (1) many blood vessels (1) • Need oxygenated blood (1) work aerobically (1) • High density of mitochondria (1) for sustained energy (1) Accept any other relevant phrasing/wording and appropriate animal examples.	4

Question Number	Answer	Mark
4e	<p>Award up to three marks for a description that makes reference to the following.</p> <ul style="list-style-type: none"> • Slice the tissue thinly (1) • Place specimen onto slide (1) • Add drop of water / stain / eosin / iodine / methylene blue onto specimen (1) • Place cover slip over specimen (1) • Eliminate air bubbles from covered slide (1) <p>Accept any other relevant phrasing/wording.</p>	3

Question Number	Answer	Mark
5a	<p>Alveoli (1) Lungs (1)</p>	1

Question Number	Answer	Mark
5b	<p>Award up to four marks for a description that makes reference to the following.</p> <ul style="list-style-type: none"> • Diaphragm contracts (1) • Causes vacuum (1) • Intercostal muscles lift the ribs (1) • Thoracic volume increases (1) • Lung pressure decreases (1) • Air flows into lungs (1) <p>Accept any other relevant phrasing/wording.</p>	4

Question Number	Answer	Mark
5c	<p>Award one mark for identification and one additional mark for appropriate expansion, up to a maximum of two marks.</p> <ul style="list-style-type: none"> • To defend against disease (1) by transporting antibodies (1) • To fight infection (1) by producing white blood cells / lymphocytes (1) <p>Accept any other relevant phrasing/wording.</p>	2

Question Number	Indicative content	Mark
5d	<p>Responses may include the following.</p> <ul style="list-style-type: none"> • The pulmonary circuit carries blood to the lungs to be oxygenated via the pulmonary artery • Gaseous exchange in the lungs- carbon dioxide is removed, and oxygen carried by haemoglobin in red blood cells to the heart via the pulmonary vein • The systemic circuit carries oxygenated blood around the body leaving the heart via the aorta • Deoxygenated blood returns to the heart via the vena cava • The cardiac cycle pumps oxygenated blood through the left side and deoxygenated blood through the right side of the heart <p>Advantages</p> <ul style="list-style-type: none"> • Increased systemic pressure • Decreased pulmonary pressure • Improved blood flow • Allows increase in body size • More oxygen / nutrients to tissues 	8
Level	Descriptor	Marks
Level 0	No rewardable material	0
Level 1	A few key points identified, or one point described in some detail. The answer is likely to be in the form of a list. Only one viewpoint considered. Points made will be superficial/generic and not applied/directly linked to the situation in the question.	1-3
Level 2	Some points identified, or a few key points described. Consideration of more than one viewpoint but there will be more emphasis on one of them. The answer is unbalanced. Most points made will be relevant to the situation in the question, but the link will not always be clear.	4-6
Level 3	Range of points described, or a few key points explained in depth. All sides of the case are considered and the answer is well-balanced, giving weight to all viewpoints. The majority of points made will be relevant and there will be a clear link to the situation in the question.	7-8

Question Number	Answer	Mark
5e	<p>Award up to two marks for each description that makes reference to the following, up to a maximum of four marks.</p> <p>Hypothermia</p> <ul style="list-style-type: none"> • Body temperature drops (1) • Shivering (1) • Lack of alertness (1) • Slow breathing (1) • low blood pressure (1) • Dilated pupils (1) • Coma • Piloerection (1) <p>Hyperthermia</p> <ul style="list-style-type: none"> • Body temperature raised (1) • Dehydration (1) • Decreased urination (1) • Uncoordinated movement (1) • Panting (1) • Sweating (1) • Unconsciousness (1) <p>Accept any other relevant phrasing/wording.</p>	4

Question Number	Answer	Mark
6a	<p>Award up to two marks for identification and one additional mark for each appropriate expansion, up to a maximum of four marks.</p> <ul style="list-style-type: none"> • Birds' temperature is higher/40 – 43 °C (1) because they have a faster metabolism (1) • Mammals' temperature is lower/ 36-40 °C (1) because they have a slower metabolism (1) <p>Accept any other relevant phrasing/wording.</p>	4

Question Number	Answer	Mark
6b	The hypothalamus (1)	1

Question Number	Answer	Mark
6c	<p>Award one mark for identification and one additional mark for appropriate expansion, up to a maximum of four marks.</p> <ul style="list-style-type: none"> • Sweating (1) from glands onto skin / evaporates / takes heat away from the body/ through paws (1) • Gular fluttering (1) in birds / heat loss through mouth / flapping membranes in throat (1) • Panting (1) water evaporates from nasal passages / mouth / lungs (1) • Vasodilation / increase blood flow (1) losing heat from the skin (1) <p>Accept any other relevant phrasing/wording.</p>	4

Question Number	Answer	Mark
6d	<p>Award up to a maximum of two marks.</p> <ul style="list-style-type: none"> • Wet scales (1) • Permanent gills (1) • Fins (1) • Breathe solely underwater (1) 	2

Question Number	Indicative content	Mark
7	<p>Responses may include the following.</p> <ul style="list-style-type: none"> • Natural selection leads to a new species evolving over time • Selection pressures are factors that contribute to natural selection and variations will increase an individual's chance of surviving over others • Examples of selective pressures include competition, predation, land clearance, pollutants, diseases and illnesses, climate change and parasitism • Variation is the differences between organisms in their DNA, which can be inherited • Some variations are advantageous over others and animals with advantageous variation are more likely to survive and reproduce • Offspring will inherit the advantageous feature, which will increase their chance of survival • Genetic variation is essential for natural selection because it can increase or decrease the frequency of alleles in the population • Certain phenotypes have an advantage for survival and reproduction and lead to evolution. Examples of giraffes reaching higher branches / peppered moths being camouflaged <p>Accept any other valid response.</p>	8
Level	Descriptor	Marks
Level 0	No rewardable material	0
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Llywodraeth Cynulliad Cymru
Welsh Assembly Government

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