Mark Scheme (Final)

January 2018

Pearson BTEC Level 3

Unit 2: Animal Biology 31645H

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January 2018
Publications Code 31645H_1801_MS

Unit 2: Animal Biology – sample marking grid

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.
- Marking 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 marking grid, not according to their perception of where the grade boundaries may lie.
- All marks on the marking grid should be used appropriately.
- All the marks on the marking 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 marking grid.
- Where judgement is required, a marking grid will provide the principles by which marks will be awarded.
- When examiners are in doubt regarding the application of the marking grid to a learner's response, a senior examiner should be consulted.

Specific marking guidance

The marking grids have been designed to assess learner work holistically. Rows in the grids identify the assessment focus/outcome being targeted. When using a marking 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 **two** marks. • Appendicular(1) – Top box only • Axial (1) – Bottom box only	2

Question Number	Answer	Mark
1b	Award **one** mark. Large/longer, hind limbs/bones (1) Curved / Flexible spine (1) Reduced/shorter forelimbs/front legs (1) Plantigrade (flattened hind foot) Long hind phalanges (accept long phalanges) (1) **Accept appropriate identified bones**	1

Question Number	Answer	Mark
1c	Award up to **two** marks. Arthritis/Osteoarthritis (1) Hip/Elbow dysplasia (1) Osteochondrosis (1) Tendonitis (1) Osteogenesis/brittle bone disease (1) Osteoporosis (1) Metabolic bone disease (1) Rickets (1) Scurvy (1) Spina Bifida (1) **Accept any other appropriate response.**	2

Question Number	Answer	Mark
2a	Award up to **four** marks. A – Cornea (1) B - Lens (1) C - Iris (1) D - Fovea (1)	4

Question Number	Answer	Mark
2b	Award **one** mark for identification and **one** for explanation, up to **two** marks. • Absorbs light (1) sends messages to optic nerve (1) • Contains cones (1) to enable colour vision (1) • Contains rods (1) to enable vision in low light (1) **Accept any other appropriate response.**	2

Question Number	Answer	Mark
2c	Award up to **four** marks. • Controls the contraction/dilation of the pupil (1) to adapt to different light levels (1) • Changes the shape of the lens (1) to focus image on the retina (1) • Controls the eye muscles (1) to change direction of vision (1) **Accept any other appropriate wording.**	4

Question Number	Answer	Mark
2d	Award up to **three** marks. Eyes on the side of the head (1) to give a wide angle of vision / peripheral vision (1) gives early detection of danger / to allow evasive action (1) **Accept any other appropriate wording.**	3

Question Number	Answer	Mark
3a	Award up to **two** marks. A- Trachea (Wind Pipe) B- Bronchioles	2

Question Number	Answer	Mark
3b	Award up to **four** marks. Diaphragm contracts/ pulls down (1) increasing chest volume / decreasing pressure / breathing in (1) Diaphragm relaxes (1) pushed up/ decreasing chest volume/ increasing pressure / breathing out (1) **Accept any other appropriate wording.**	4

Question Number	Answer	Mark
3c	Award one mark for each descriptive point, to a total of four marks • As carbon dioxide levels increase/decrease/Bohr effect (1), this increases/decreases respiratory rate (1) • Signals from the brain(1) stimulate contraction in the diaphragm / intercostal muscles (1) • Raised temperature (1) stimulates respiratory rate(1) • Muscle/joint receptors(1) feedback to respiratory centre(1) • Receptors in lung walls(1) control tidal volume(1) • Increase lactic acid/oxygen debt/anaerobic respiration (1) increases rate of ventilation (1) **Accept any other appropriate answer.**	four

Question Number	Answer	Mark
4a	Award **one** mark for identification and **one** mark for expansion, for each structure up to a total of **four** marks. Yolk : • Provides a food source (1) for the developing embryo (1) Albumen: • Protective fluid (1) prevents adhesion to the shell/protect embryo/protect yolk (1) • Additional nutrition (1) to support growth of the embryo (1) **Accept any other appropriate wording.**	4

Question Number	Answer	Mark
4b	Award **one** mark for identification, **one** for expansion to a total of **two** marks**.** Reduced daylight (1) leads to reduced egg production (1) Increased daylight (1) leads to increased egg production (1) Increased hormones (1) stimulates egg release (1) **Accept any other appropriate wording.**	2

Question Number	Answer	Mark
5a	**One** mark per identification, **one** mark for each expansion to a total of **four** marks. • Carbohydrates are the main source of energy (1) essential for brain / movement of muscles (1) • Complex carbohydrates provide bulk in the diet (1) necessary for intestinal health/waste elimination/ slow release energy (1) • Simple carbohydrate / sugar short term store (1) to provide quick energy (1) • Excess carbohydrate stored as fat (1) for keeping warm/energy stored (1) **Award any other appropriate answers.**	4

Question Number	Answer	Mark
5b	Award **one** mark for identification, **one** mark for expansion to a total of **four** marks. • Production of bile (1) to emulsify fats (1) • Removing toxins from the blood (1) to improve / protect kidney function (1) • Involved in regulation of blood sugar (1) by storing/ releasing glucose (1) • Remove by-products of protein digestion (1) by conversion of harmful ammonia to urea (1) **Accept any other appropriate answer.**	2

Question Number	Answer – indicative content	Mark
5c	Blood sugar is a result of carbohydrate digestion. Blood glucose levels are maintained primarily by the actions of insulin and glucagon in a negative feedback loop. As blood glucose levels increase the pancreas responds by secreting insulin. Insulin stimulates in the liver and skeletal muscle cells to the form glycogen from glucose. Insulin stimulates liver cells and adipose tissue to synthesis fat from glucose. As blood glucose levels decrease glucagon (hormone) is produced. Glucagon stimulates the liver and skeletal muscle cells to breakdown glycogen to glucose. **Answers may include diagrams, credit where accurate**	8

Mark scheme (Award up to 8 marks) Refer to the guidance on the cover of this document for how to apply Levels Based Mark Schemes*.

Level	Mark	Descriptor
Level 0	**0**	**No rewardable material**
Level 1	**1-2**	Demonstrates isolated elements of knowledge and understanding. Generic statements may be presented rather than linkages being made. Lines of reasoning are unsupported.
Level 2	**3-5**	Demonstrates mostly accurate knowledge and understanding. Answer evidences occasional linkages between the elements in the context of the question. Lines of reasoning occasionally supported through the application of relevant evidence.
Level 3	**6-8**	Demonstrates accurate and thorough knowledge and understanding. Answer evidences comprehensive linkages between the elements in the context of the question. Lines of reasoning supported throughout by sustained application of relevant evidence.

Question Number	Answer	Mark
6a	**One** mark for each of the following to a total of **two** marks. Cuboidal (1) Squamous (1) Pseudostratified (1) Columnar (1)	2

Question Number	Answer	Mark
6b	Award **one** mark per identification, **one** mark for each expansion to a total of **four** marks. Removes dirt and foreign bodies (1) to prevent infection (1) Moves ova (1) down the fallopian tube (1) Moves mucous secretions (1) for effective gaseous exchange (1) **Accept any other appropriate wording.**	4

Question Number	Answer	Mark
6c	Award **one** mark for each descriptive point, to a total of **four** marks. Actin / thin filaments (1) Myosin / thick filaments (1) They slide past each other (1) Shortening the muscle/sarcomere (1) Calcium binds to troponin (1) Cross bridges are formed (1) Energy is provided by ATP (1) The process is triggered by calcium (1) **Accept any other appropriate wording.**	four

Question Number	Answer	Mark
6d	Award **one** mark for each correct point to a total of **four** marks. No more than **Three** marks for one type of fibre **Fast twitch fibre** • Enable muscles to move quickly (1) • Used for short bursts of energy (1) • Use anaerobic respiration/build up lactic acid (1) • Low capillary density (1) • Longer recovery rate • Lighter colour/lower myoglobin levels (1) **Slow twitch fibres** • Provide power (1) • Used for endurance (1) • Stores more Oxygen-aerobic respiration (1) • High capillary density (1) • Shorter recovery rate (1) • Darker colour/higher Myoglobin levels (1) **Accept appropriate examples of use in animals.** **Accept any other appropriate wording.**	4

Question Number	Answer	Mark
7a	Award **one** mark per identification, **one** mark for each expansion to a total of **four** marks. . • Prevents dehydration (1) so cells / organs can function effectively (1) • Aids faecal elimination (1) by lubricating the intestines (1) • Improves the effectiveness of digestion (1) by increasing nutrient absorption (1) • reactant (1) involved in chemical reactions (1) • A solvent (1) for soluble chemicals (accept specific examples) (1) **Accept any other appropriate wording.**	4

Question Number	Answer	Mark
7b	Award **one** mark per identification, **one** mark for each expansion to a total of **four** marks. • A large surface area / many micro villi (1) so more molecules can be absorbed (1) • Good blood supply (1) to allow increased diffusion of molecules (1) • Lacteal / Lymph vessels (1) allows absorption of lipids (1) • Think walls (1) efficient diffusion (1) **Accept any other appropriate wording.**	4

Question Number	Answer	Mark
7c	Birds have beaks rather than teeth. Shape of the beak is indicative of what they eat. They ingest grit to allow mechanic digestion in the gizzard. Crop for storage of food. A cloaca allows elimination of uric acid and faeces. Two parted / sections of stomach, the gizzard and the proventriculus. Muscular gizzard for mechanical digestion. Proventriculus for chemical digestion. Two caecum to increase absorption of water.	8

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Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE