Mark Scheme

Additional Sample Assessment Material

Pearson BTEC Level 3 – Animal Management and Animal Management with Science

Unit 2: Animal Biology

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk for our BTEC qualifications.
Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson.
Their contact details can be found on this link: www.edexcel.com/teachingservices

You can also use our online Ask the Expert service at www.edexcel.com/ask. You will need an Edexcel username and password to access this service.

Pearson: helping people progress, everywhere
Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

June 2016
Publications Code xxxxxxxx*

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.

BTEC Next Generation Mark Scheme Template

Question Number	Answer	Mark
1a)	Award 1 mark for each grouping level identified correctly. • Phylum (1) • Family (1)	2

Question Number	Answer	Mark
1 b)	The specific name should have a lower case 'm'.	1

Question Number	Answer	Mark
1 c)	Award **one** mark for any of the following up to a maximum of **two** marks for each sub-question: i) Endothermic, produces milk, gives birth to live young ii) Feathers, lay eggs, beaks/no teeth, endothermic, wings	4

Question Number	Answer	Mark
2 a)	Award **one** mark for any of the following up to a maximum of **two** marks: • Locomotion • Protection • Mineral storage • Haematopoiesis	2

Question Number	Answer	Mark
2 b)	Accept any one of the following; award **one** mark for identification and **one** for explanation: An outer layer of coat (1) to keep off the rain (1) Retractable claws and rotating wrists (1) for gripping prey and climbing trees (1). Immensely powerful thigh muscles (1) for running at high speeds (1). Good balance and agility (1) to allow them to chase prey over difficult terrains and various heights (1). A thick coat (1) one layer to keep in the warm(1) Eyes positioned at the front of the head (1) to improve focus and depth perception (1).	2

	Flexible spines (1) to allow the use of more muscles when running OR to allow them to fall from a height and land feet first (1).	

Question Number	Answer	Mark
2 c) (i)	Award **one** mark for the cause and **one** additional mark for the symptom. • Genetics • Injury/Trauma • Obesity • Acromegaly	1
2 c) (ii)	• Reduced mobility • Reduced activity • Altered grooming • Temperament changes	1

Question Number	Answer	Mark
2 d)	Award **one** mark for identification and **two** marks for expansion, up to a total of **three** marks. • Tapetum lucidum behind the retina reflects light (1) this means night vision is exceptional (1) it is around seven times better than humans. (1) • Proportionally more rods than cones than other animals (1) peripheral vision is very good (1) so their eyes are tuned primarily to see movement. (1)	3

Question Number	Answer	Mark
3 a)	A Uterine horn/Fallopian tube (1) B Cervix (1)	2

Question Number	Answer	Mark
3 b)	114 days or 3 months, 3 weeks and 3 days. (1)	1

Question Number	Answer	Mark
3 c)	Epithelial tissue (1) Accept Epithelial or Endometrium	1

Question Number	Answer	Mark
3 d)	Award **one** mark for identification and **one** mark for description: i. Increase in FSH until just before ovulation (1) after which it decreases (1) OR stimulates ovarian follicles. (1) ii. Increase in LH (1) stimulates oestrogen and progesterone production from the ovary (1) OR is responsible for ovulation. (1)	4

Question Number	Answer	Mark
3 e)	Oestrogen (1) Progesterone (1)	2

Question Number	Answer	Mark
4	Mitochondria (1)	1

Question Number	Answer	Mark
5 a)	Award **one** mark for identification of function of each structure and **one** mark for relevant explanation, up to a maximum of **four** marks. • Structure 1: Plant fibre is broken down (1) by bacteria. (1) • Structure 3: Efficient absorption (1) of water/salts. (1)	4

Question Number	Answer	Mark
5 b)	Peristalsis (1)	1

Question Number	Answer	Mark
5 c)	Increase the surface area of the small intestine (1) which will increase nutrient absorption. (1) Accept similar wording.	2

Question Number	Answer	Mark
5 d)	Award **one** mark for any of the following, up to **two** marks. • Monogastrics have a single-chambered stomach, but ruminants have a four-chambered stomach. • Ruminants have a rumen where some absorption occurs, while no absorption happens in a monogastric stomach. • Ruminants are always herbivores while monogastrics show all types of food habits. • The digestive system of ruminants is more efficient than the monogastric system in breaking down cellulose and absorbing nutrients. • Ruminants regurgitate the ingested food during digestion, but monogastrics do not. • Ruminants are foregut fermenters while monogastric herbivores are hindgut fermenters.	2

Question Number	Answer	Mark
5 e)	Award **one** mark for any of the following: i. Cause: • do not discriminate against metal materials in feed • do not completely masticate feed before swallowing. Award **one** mark for any of the following up to **two** marks: ii. Consequence: • raised temperature • increased heart rate • increased breathing rate	3

	• surgical or medical treatment is required.	

Question Number	Answer	Mark
6 a)	273 + 101/ 2= 187 (2)	2

Question Number	Answer	Mark
6 b)	Accept any **two** of the following: • pumping oxygenated blood around the body • transport of oxygen and energy products (glucose, fatty acids) to the muscle fibres • aerobic energy production • transport blood cells • the removal of waste products (lactate, carbon dioxide, water) from them. • during exercise, oxygen delivery is improved by increases in the volume of air breathed, the amount of blood pumped by the heart, and the oxygen carrying capacity of the blood. Accept similar wording.	2

Question Number	Answer	Mark
6 c) i)	Award **one** mark for: • raised carbon dioxide levels in the blood (1)	1

Question Number	Answer	Mark
6 c) ii)	Award **one** mark for each of the following, up to **four** marks: The intercostal muscles contract and the ribcage rises. (1) Diaphragm contracts (tightens) and moves downward. (1) Volume of chest cavity increases. (1) Pressure in the lungs decreases. (1) After passing through bronchial tubes, the air finally reaches and enters the alveoli (air sacs). (1)	4

Question Number	Answer	Mark
6 d)	Award **one** mark for each of the following up to **eight** marks. An exchange of gases between the gases inside the alveoli and the blood. (1) Blood in the alveoli has a higher carbon dioxide concentration which is produced during respiration. (1) In the alveoli there is a much lower concentration of carbon dioxide (1), meaning there is a concentration gradient (1) which allows carbon dioxide to diffuse out of the blood and into the alveoli. (1) Blood arriving in the alveoli has a lower oxygen concentration (1). In the alveoli there is a higher oxygen concentration. (1) Therefore, oxygen moves into the blood by diffusion (1) and combines with the haemoglobin in red blood cells to form oxyhaemoglobin. (1) Accept similar wording.	8

Question Number	Answer	Mark
6 e) i)	A- Aorta (1) B- Tricuspid Valve (1)	2

Question Number	Answer	Mark
6 e) ii)	Award **one** mark for identification of structure and up to **two** marks for function, for a total of **three** marks: Valves (1) prevent backflow of blood (1) so it does not re-enter left atrium. (1) Thicker walls (1) to pump blood around the body (1) and to withstand higher pressure as the blood is forced out around the body. (1)	3

Question Number	Answer	Mark
7 a) i)	Acetylcholine causes the depolarisation (1) of the motor end plate (end of motor neurone). (1) This message travels throughout the muscle (1), causing calcium to be released by parts of the muscle (1), resulting in muscle contractions.	4
ii)	Increased calcium binds to troponin (1) and so moving tropomyosin from the active site of the actin. (1)	2
iii)	The breakdown of ATP causes energy to be released (1) which enables the myosin to pull the actin filaments inwards and so shortening the muscle. (1)	2
Question Number	**Answer**	**Mark**
7 b)	Award **one** mark for any of the following, up to **three** marks: Nerve impulses travel down a myelinated axon (1), they jump from node to node (1) in a process called saltatory conduction. (1) The previous node repolarises (1), Na+ channels open in the stimulated node (1) and the influx of Na+ ions depolarises the area (1). Passive current develops due to attractions between oppositely charged ions in the adjacent nodes. (1) The myelin sheath insulates the axon (1) and allows the current to travel the long distances	3

	between nodes without decaying below threshold level. (1) Accept similar wording. Answer must follow a logical order.	

Question Number	Indicative Content	Mark
8	Counter-current heat exchange is an alternative to insulation on the limbs. Limbs are thin and have a large surface area making them prone to heat loss. Arterial blood is warm as it originates from the core of an animal. Venous blood in the limbs will be cold as it is returning from the areas furthest away from the core. When arteries and veins pass, the heat from the arterial blood passes to the venous blood. Arterial blood entering the peripheries progressively cools as it moves down the limb. The heat is carried back towards the core/heart via the venous blood. Less heat is lost by the animal. (Meaning that less energy will be required to maintain the core body temp.) Accept similar wording.	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.

For more information on Edexcel qualifications, please visit our website
www.edexcel.com

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