Examiners' Report
Lead Examiner Feedback

January 2021

Pearson BTEC Nationals in Equine Management (20108K)
Unit 1: Equine Structure, Form and Function

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Introduction to the Overall Performance of the Unit

This was the fifth sitting of this exam and the original numbers of learners registered to take the exam was the highest so far. However, due to the ongoing Government restrictions in place due to the Covid 19 pandemic the actual number of learners sitting the exam was considerably lower.

Despite the low numbers all questions were attempted by some learners, with some learners demonstrating a clear ability to apply the knowledge learnt from the specification. However, there were a significant number of learners who made a very limited attempt at answering the paper, leaving many answers blank.

This paper was able to evidence effective ramping of the questions, with there being an obvious drop off point where pass level learners struggled to access marks in questions which were targeted at merit or distinction learners. The 8-mark questions were also highly effective in discriminating the level of learner as the candidates had to discuss the types of muscles and joint angles and their impact.

The percentage of blank responses across the paper was higher than in previous papers. Areas of weakness included reproductive hormones, terminology relating to parts of the bone and familiarity with the term appendage.

In questions which tested higher level skills, explanations and discussions were provided by some learners. The most able candidates were able to apply the knowledge in a range of scenarios, including complex situations where a number of cognitive steps were required, and top marks were awarded for these questions.

Finally, learners would continue to benefit from additional coaching on exam technique, in particular the way to structure answers for “explain” questions to ensure maximum marks are achieved as this continues to be where marks are unnecessarily lost and should be reminded that they will not be awarded marks for using terminology found within the question as their answer.

Individual Questions

Question 1a

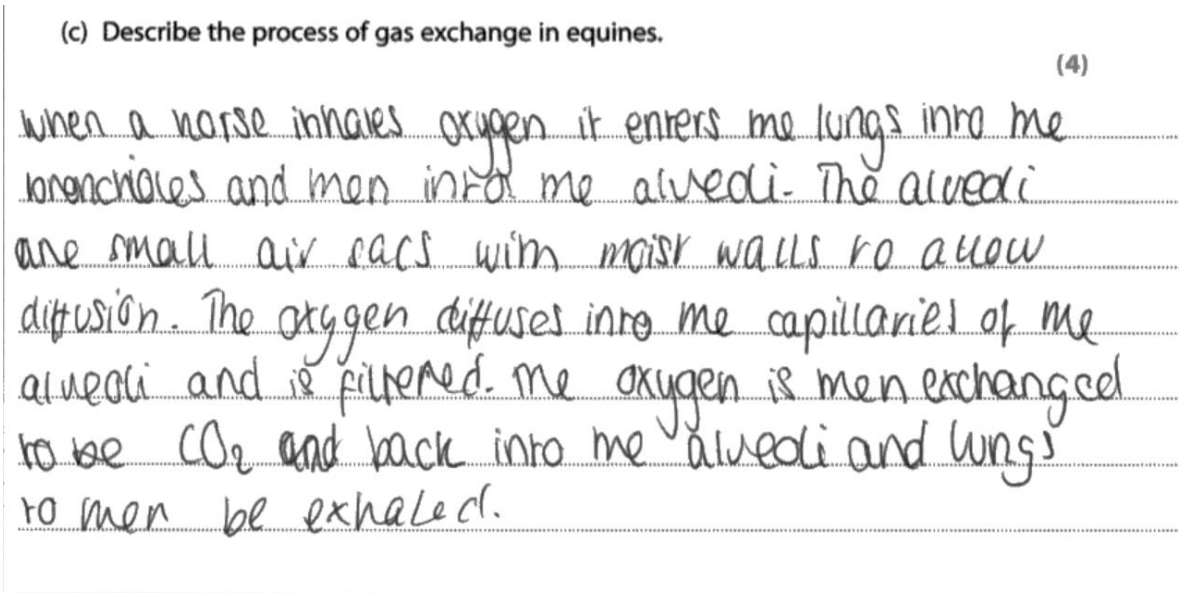
This was a labelling question worth two marks. Learners were provided with an image of an equine heart and were asked to label two parts, the aorta and left atrium. As a pass level question this had a mixed response, the question was attempted by the majority of leaners with most offering anatomical parts of the heart, but unfortunately confusing the left and the right as well as the atrium and ventricle, and therefore only a few learners were able to access both the marks.

Question 1b

This was another image-based questions where learners were provided with an image of the equine circulatory system and were asked to identify which arrow pointed to the pulmonary artery. This question did not perform well, with learners appearing to guess at the answer.

Question 1c

This was a 4 mark question where learners had to explain the process of gas exchange. Most learners were able to make reference to the breathing in of oxygen and out of carbon dioxide and overall, the question was well answered.



(c) Describe the process of gas exchange in equines.

(4)

when a horse inhales oxygen it enters the lungs into the bronchioles and then into the alveoli. The alveoli are small air sacs with moist walls to allow diffusion. The oxygen diffuses into the capillaries of the alveoli and is filtered. The oxygen is then exchanged to be CO_2 and back into the alveoli and lungs to then be exhaled.

4 marks awarded. A clear explanation of gas exchange.

Question 1d

This was a 2 mark question where learners were asked to explain the role of the ribs. This question was very well answered with most learners stating protection as the function and explaining this further by identifying that is was the equines vital organs which were being protected.

(d) Explain **one** function of the ribs.

(2)

The ribs protect all the vital organs in the body because they create a cage around them.

(Total for Question 1 = 9 marks)

2 marks awarded. Protection (1) for the vital organs (1)

Question 2a

This was another question with an image. Learners were asked to label the two components of the mares reproductive tract. marks. Most learners were able to correctly identify the ovaries but struggled with the vagina, offering a range in incorrect answers including fallopian tubes, uterus and bladder.

2 Figure 3 shows the anatomy of a mare's reproductive tract.

(a) Identify structures A and B in Figure 3 using the boxes provided.

(2)

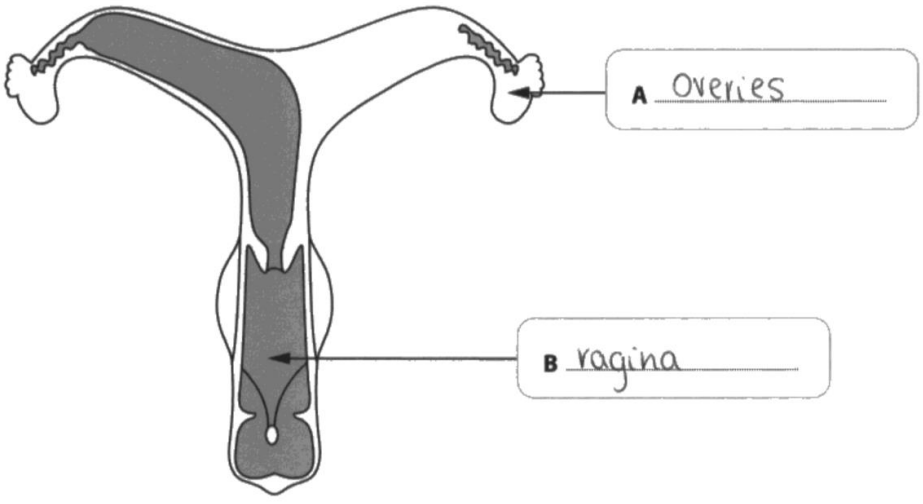
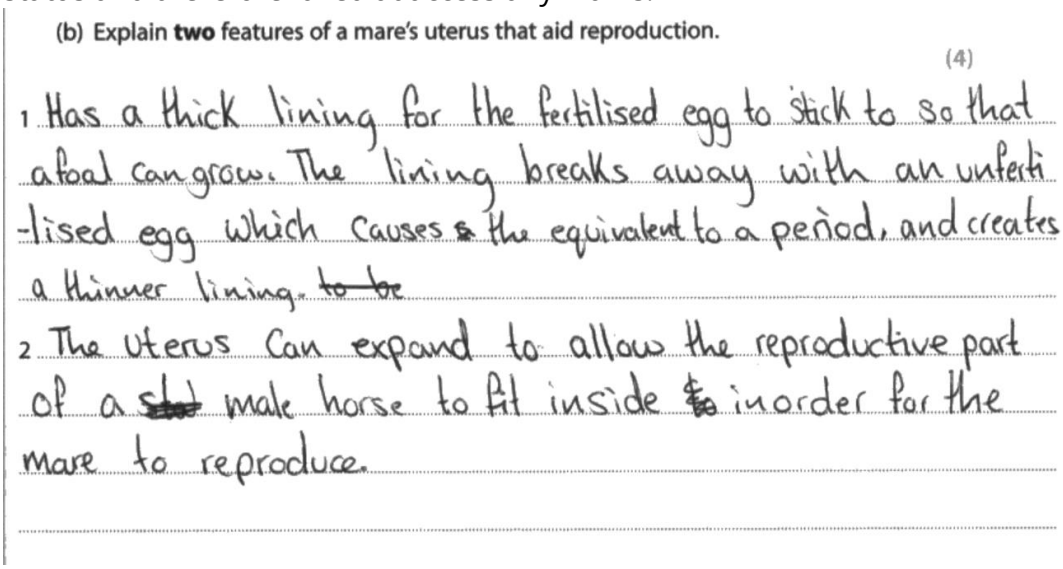


Figure 3

2 marks awarded – labels correctly identified.

Question 2b

This question was worth a maximum of 4 marks and asked the candidates to describe features of a mare's uterus that aid reproduction. A significant number of leaners did not correctly answer the question – explaining features of the mares reproductive system rather than feature of the uterus. There were also a number of learners who provided answers relating to behaviours indicators of reproductive status and therefore failed at access any marks.



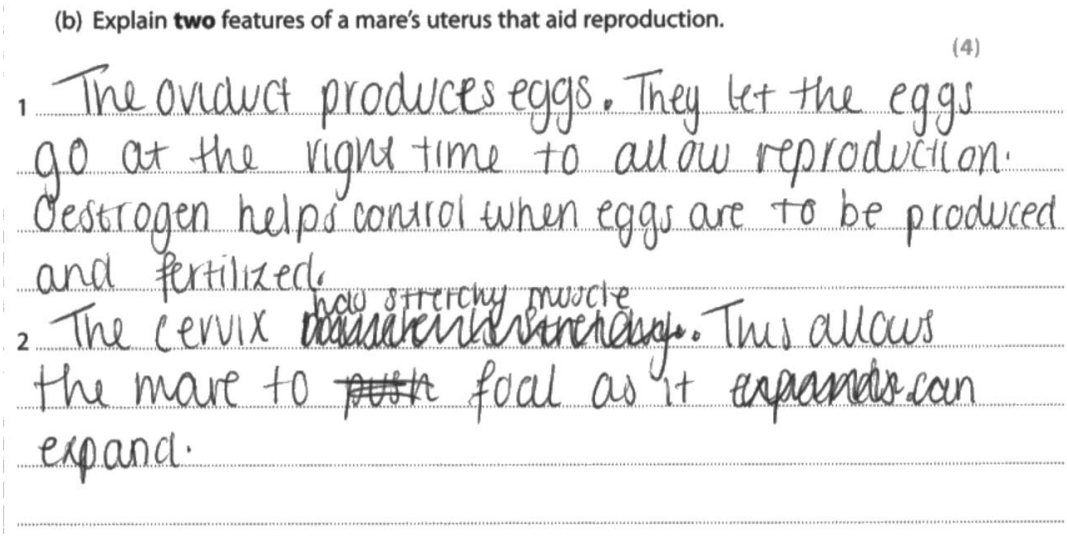
(b) Explain **two** features of a mare's uterus that aid reproduction.

(4)

1 Has a thick lining for the fertilised egg to stick to so that a foal can grow. The lining breaks away with an unfertilised egg which causes the equivalent to a period, and creates a thinner lining. ~~to be~~

2 The uterus can expand to allow the reproductive part of a ~~stud~~ male horse to fit inside ~~to~~ inorder for the mare to reproduce.

4 marks awarded: lining (1) for implantation (1), walls expand (1) to support growing foetus (1)



(b) Explain **two** features of a mare's uterus that aid reproduction.

(4)

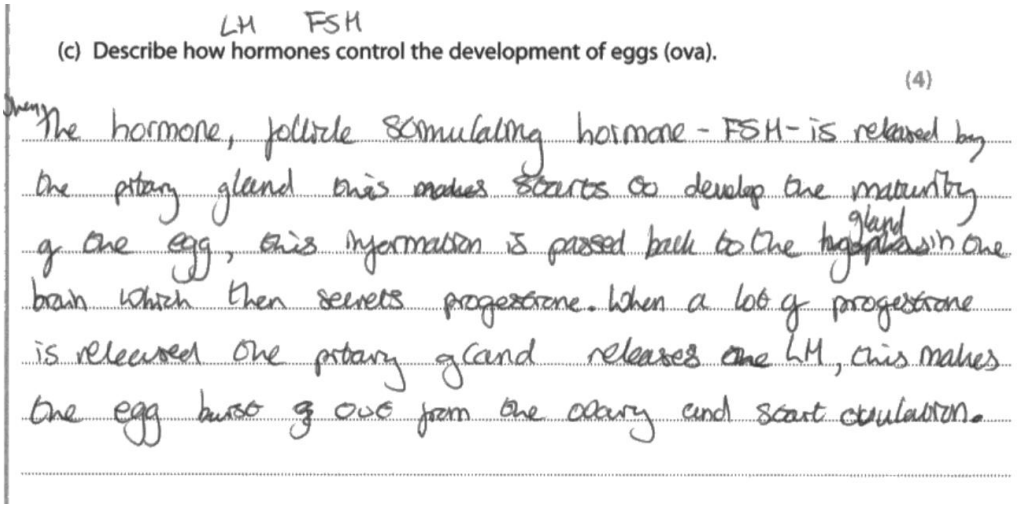
1 The oviduct produces eggs. They let the eggs go at the right time to allow reproduction. Oestrogen helps control when eggs are to be produced and fertilized.

2 The cervix how stretchy muscle ~~dilates during~~. This allows the mare to ~~push~~ foal as it ~~expands~~ can expand.

0 marks awarded: A commonly seen incorrect answer.

Question 2c

In the question learners were asked to describe how hormones control the development of eggs for four marks. Learners struggled to access the marks for this, often offering vague answers such as hormones go up and down or a hormone imbalance causes egg release but failed to name ant specific hormones involved in the process. There were also a number of learners who discussed hormonal control of reproduction as a whole, rather than specifically in relation to egg development.



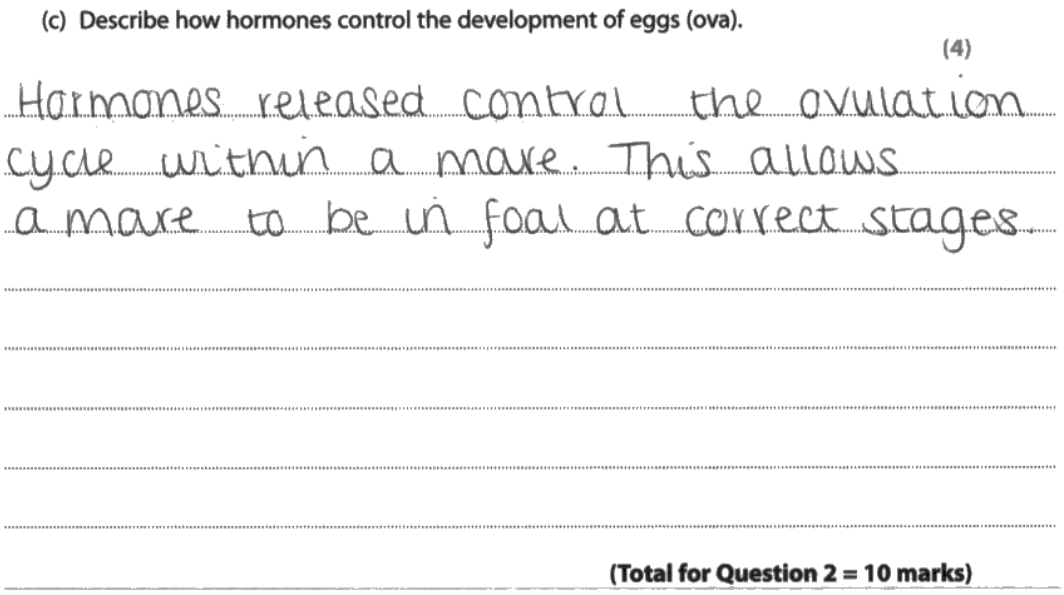
LH FSH

(c) Describe how hormones control the development of eggs (ova).

(4)

The hormone, follicle stimulating hormone - FSH - is released by the pitary gland this makes ~~ovaries~~ to develop the maturity of the egg, this information is passed back to the hypothalamus gland in the brain which then secrets progesterone. When a lot of progesterone is released the pitary gland releases the LH, this makes the egg burst of ovo from the ovary and start ovulation.

4 marks awarded. The learner has identified two correct hormones and their roles.



(c) Describe how hormones control the development of eggs (ova).

(4)

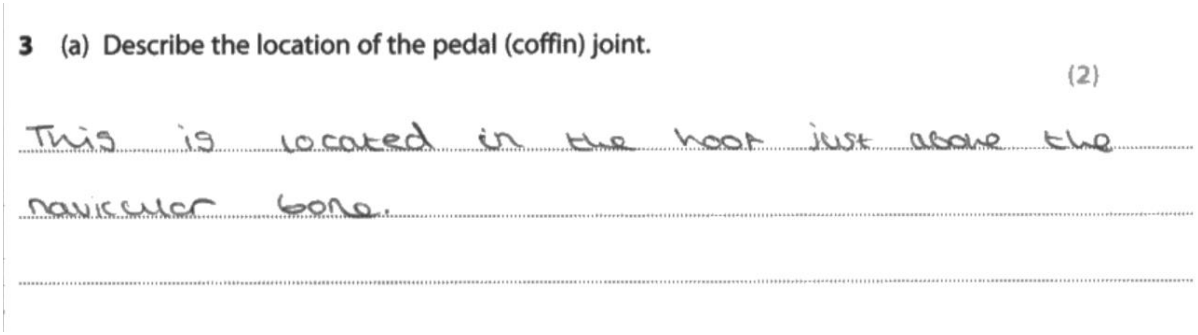
Hormones released control the ovulation cycle within a mare. This allows a mare to be in foal at correct stages.

(Total for Question 2 = 10 marks)

0 marks awarded: no rewardable material

Question 3a

This was a 2-mark question where learners were asked to describe the location of the pedal (coffin) joint. This is one example of where learners attempted to answer to create an answer using the wording in the question. With some learners stating 'by the coffin bone' which does not demonstrate any understanding. However, a variety of correct descriptions were seen, and leaners generally performed well in this question.


3 (a) Describe the location of the pedal (coffin) joint.

(2)

This is located in the hoof just above the navicular bone.

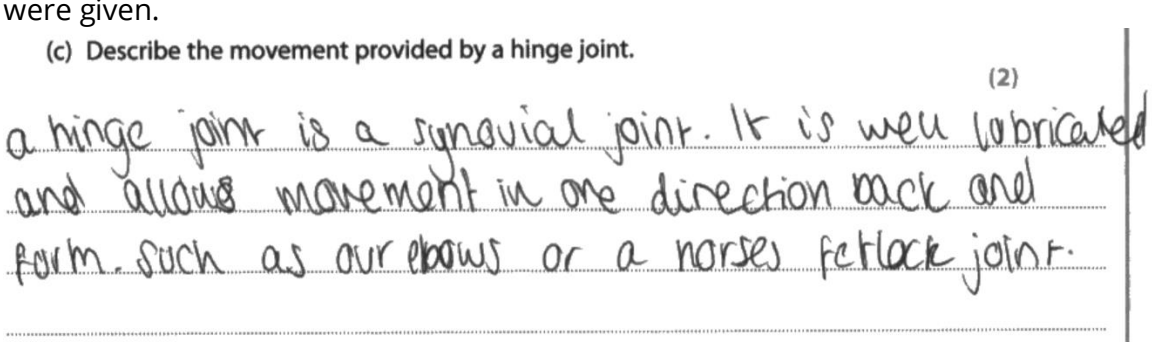
2 marks awarded, in the hoof (1) by the navicular bone (1)

Question 3b

This was a 4 mark, describe question with learners being asked to describe two functions of the frog. This question provided a variety of answers, as expected, however many leaners were only obtaining two of the four marks due to lacking a clear explanation or repeating the same answer in a different way.

Question 3c

This was a 2 mark question where learners were asked to describe the movement provided by a hinge joint. This question performed well with most learners being clear on the type of movement provided by a hinge joint and a range of examples were given.


(c) Describe the movement provided by a hinge joint.

(2)

a hinge joint is a synovial joint. It is well lubricated and allows movement in one direction back and forth. such as our elbows or a horses fetlock joint.

2 marks awarded: movement in 1 direction (1) example: elbow (1)

Question 3d

This was a 4-mark question where learners had to describe which bones make up the equine upper foreleg. While learners were able to list a range of bones, a number of leaners did not provide an answer which focused on the **upper** foreleg which was not rewardable.

There are three bones that make up the upper foreleg, these are humerous, radius and ulna. The humerous is the biggest out of those three so it is above the radius and ulna that come as a pair which sit just below with the ulna behind the radius.

4 marks awarded. A clear, logical description of the bones in the upper foreleg.

Question 4a

This was a 2 mark question where learners had to describe the basal surface of a tissue. This question was not well answered, with learners struggling to access even one of the marks available. It is clear that most learners were not familiar with this term.

4 (a) Describe the basal surface of a tissue.

(2)

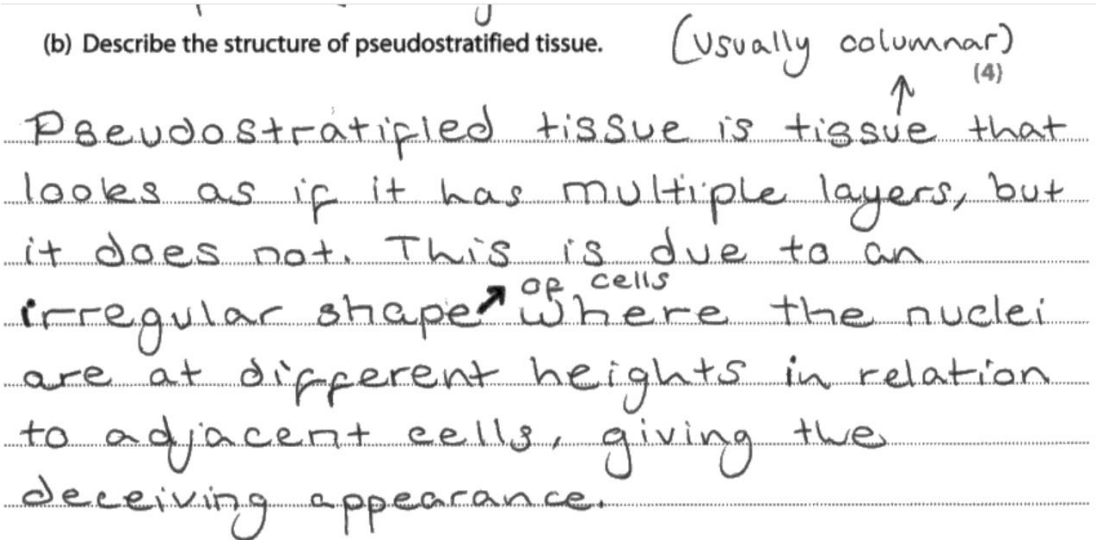
The basal surface helps to develop and grow the hair follicles and helps the dermis and glands from getting bacteria in them.

0 marks awarded: No correct information provided.

Question 4b

This was a 4-mark question where candidates were asked to describe the structure of pseudostratisfied tissue.

Despite being a term that is listed in the unit content most learners struggled with this question, either discussing stratisfied tissue or leaving the answer blank.



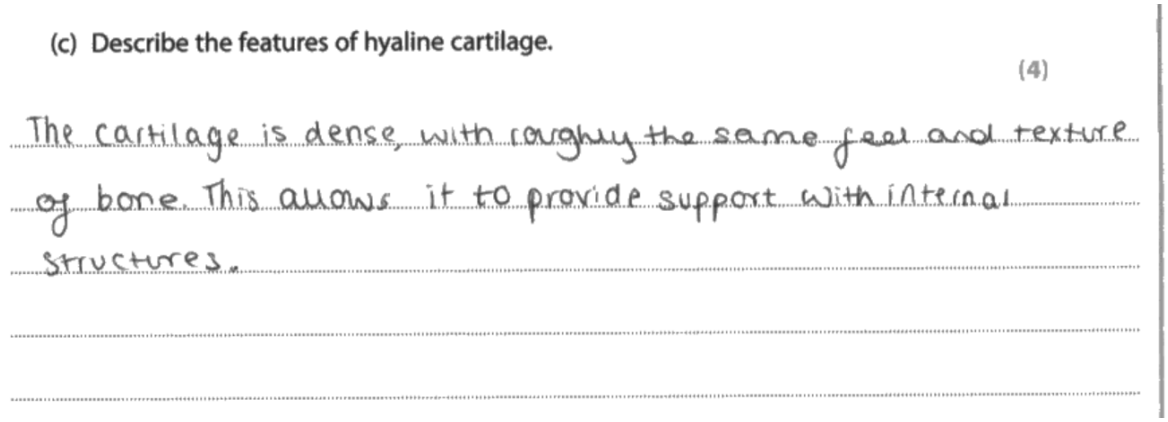
(b) Describe the structure of pseudostratified tissue. (Usually columnar) (4)

Pseudostratified tissue is tissue that looks as if it has multiple layers, but it does not. This is due to an irregular shape of cells where the nuclei are at different heights in relation to adjacent cells, giving the deceiving appearance.

4 marks awarded. Single layer (1) but appears as multiple layers (1) due to irregular shape (1) and nucleus position (1)

Question 4c

This was a 4-mark question where learners were asked to describe the structure of hyaline cartilage. This question was very poorly answered with most learners either leaving the answer blank and providing an answer relating to fibrocartilage. It can be assumed that learners were not familiar with the terminology.



(c) Describe the features of hyaline cartilage. (4)

The cartilage is dense, with roughly the same feel and texture of bone. This allows it to provide support with internal structures.

2 marks awarded: dense (1) provides supports (1)

Question 5

This was the first 8-mark question of the paper where learners had to discuss joint angles in equine anatomy and factors that affect them.

Most learners did not link this to a discussion of horse conformation but rather discussed different types of joints, which while rewardable prevented them from accessing the higher bands. Most learners were providing only very basic answers listing three joint types along with a sentence explaining the range of motion of each joint type.

5 Discuss joint angles in equine anatomy and factors that affect them.

(8)

there are hinge joints. Hinge joints allows the horse to extend the leg and relax the leg which means it can only go a minimal amount of movement. It can also be found in the Coffin, Pastern, Radius etc.

[redacted]

ball and Socket joints. ball and Socket joints allow rotation in the bone, this helps the bones from rubbing onto each other when moving. It is designed to have a bone within a curved-shaped bone so that the bone doesn't move out of place when moving.

Plane joint. Plane joints are found in the Vertebra which allows a 2 degree direction of movement this only allows the bones to slide over each other when moving.

Axis joints. An Axis joint is within the head which only allows a left to right movement however; also remains a limited amount of movement

2 marks awarded: A basic description of joint types, no linking to joint angles or their impact.

Question 6a

This was a 1-mark question were learners were asked to state the type of cells that transport nerve impulses. Despite being a pass level, direct recall answer many learners were unable to provide the correct answer, with a variety of wrong answers seen, including blood cells, epithelial and stem cells.

6 (a) State the type of cells that transport nerve impulses.

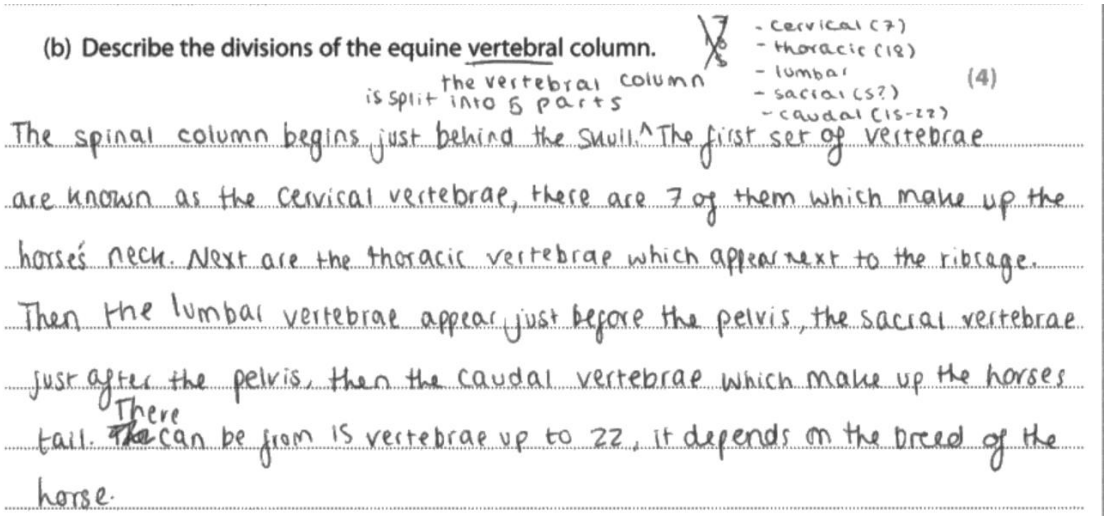
(1)

Neurons

1 mark awarded.

Question 6b

This was a 4 mark question where learners were asked to describe the divisions of the equine vertebrate. Most learners were able to demonstrate good knowledge of this subject and provided correct answers, often providing significantly more detail than was required for the four marks.



(b) Describe the divisions of the equine vertebral column. **(4)**

- cervical (7)
- thoracic (18)
- lumbar
- sacral (5?)
- caudal (15-22)

the vertebral column is split into 5 parts

The spinal column begins just behind the skull. The first set of vertebrae are known as the cervical vertebrae, there are 7 of them which make up the horses neck. Next are the thoracic vertebrae which appear next to the ribcage. Then the lumbar vertebrae appear just before the pelvis, the sacral vertebrae just after the pelvis, then the caudal vertebrae which make up the horses tail. There can be from 15 vertebrae up to 22, it depends on the breed of the horse.

4 marks awarded. 2 correct divisions identified and described.

Question 6c

This was a 4 mark question where learners were asked to explain two roles of the parasympathetic nervous system. Most learners struggled to access the marks for this question. Either they demonstrated no knowledge of what the parasympathetic nervous system was, or they confused it with the sympathetic nervous system and therefore failed to access the marks.

(c) Explain **two** roles of the parasympathetic nervous system.

(4)

1 To slow down heart rate an and balance it out to a the resting rate. This is needed because the sympathetic nervous system increases the heart rate and this wastes energy, so when an elevated heart rate is not required, it must be balanced

2 It increases the speed of food breakdown. Digestion is not vital in response to a potential danger, so the sympathetic nervous system slows this down to use the energy for a 'fight or flight response' and the parasympathetic must to give the energy back for digestion.

4 marks awarded. heart rate slows (1) to return body to resting state (1). Stomach secretions increase (1) to restart the digestive processes (1)

Question 6d

This was a higher level 4 mark question where learners had to describe how neurotransmitters work at a synapse. While many learners understood that the neurotransmitters were responsible for moving impulses through the brain very few were able to provide a more detailed description. There were no learners in the cohort who were able to offer any information about the action potential. Many learners discussed the neurotransmitters a nerve impulse, moving around the brain.

(d) Describe how neurotransmitters work at a synapse.

(4)

Neurotransmitters work by when pain is felt in the body it sends signals to the synapse which tells the brain you have been hurt and you are in pain. They keep feeding information back and forth between each other.

0 marks awarded. No rewardable material.

Question 7a

Most learners struggled with this 2 mark question. To access the marks learners were asked to state two skin appendages to the quine body. Despite being listed in the specification learners did not appear to be familiar with this term and as a result provided incorrect answers which were in some way related to the skin.

7 (a) State **two** skin appendages to the equine body.

(2)

1 epidermis

2 Sweat gland.

0 marks awarded. No rewardable material.

Question 7b

This was a 2 mark question where learners had to explain what the periosteum is in relation to bone. The scaffolding of the question but adding 'in relation to bone' was a deliberate attempt to support learners in answering the question, however it did not appear to add in the provision of correct answers, with learners instead providing a range of incorrect answers relating to bone. Very few learners were able to access even one of the two available marks, indicating that they were not familiar with the terminology.

(b) Explain what the periosteum is in relation to bones.

(2)

the periosteum in relation to bones are used to help or repair the injured bone.

1 mark awarded. Bone growth / repair (1)

(b) Explain what the periosteum is in relation to bones.

(2)

the periosteum is the bone marrow inside the bones

0 marks awarded. No rewardable material.

Question 7c

This was another bone terminology question worth 2 marks, with learners being asked to explain with the epiphysis is in relation to bones. As with question 7b, learners did not perform well in this question, demonstrating a lack of familiarity with the terminology within the unit content.

(c) Explain what the epiphysis is in relation to bones.

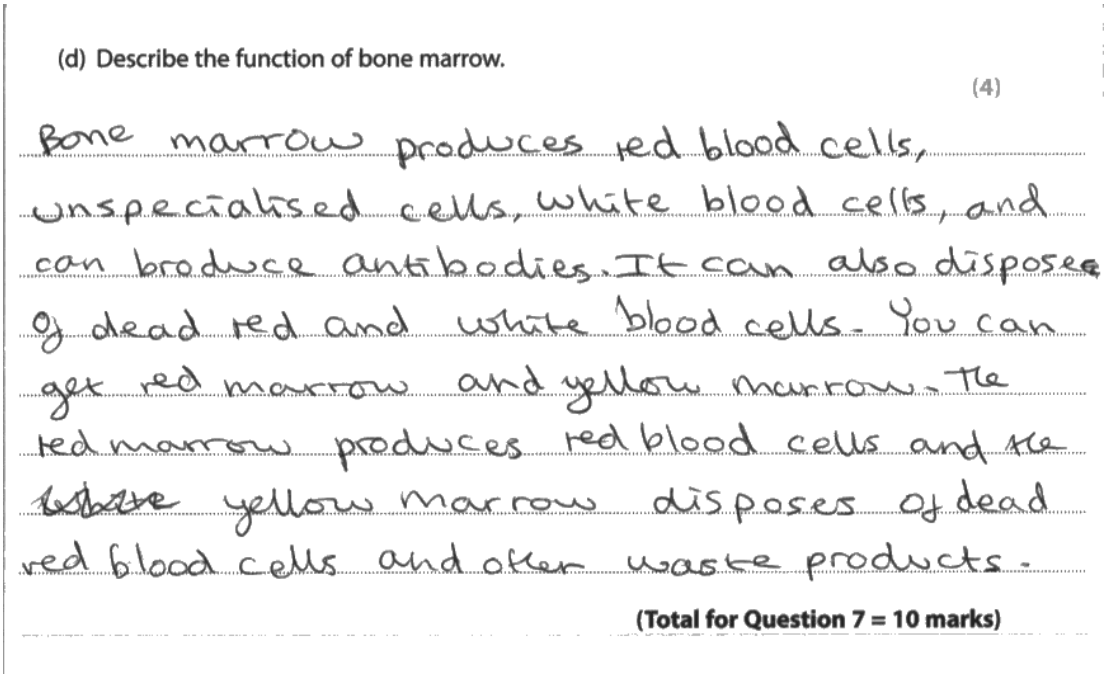
(2)

epiphysis in relation to bones is the top part of the long bone.

1 mark awarded. end of long bones (1)

Question 7d

In this 4 mark question learners were asked to describe the function of bone marrow. While learners did appear more familiar with bone marrow than with the other bone related terminology many learners were still struggling to access all four marks. This is often due to learners stating that bone marrow produces red or white blood cells and then describing the role of these cells rather than the bone marrow itself.



(d) Describe the function of bone marrow.

(4)

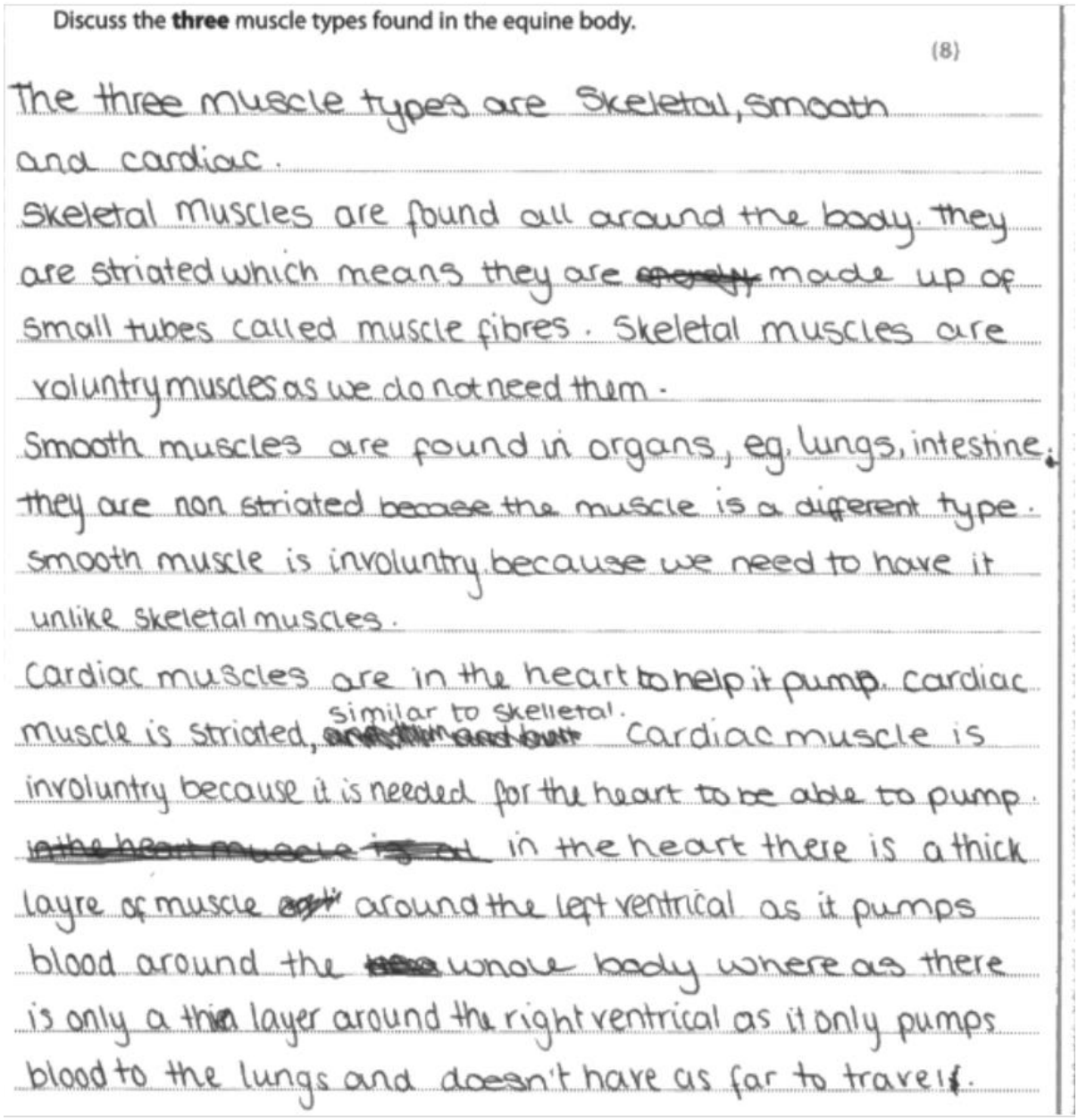
Bone marrow produces red blood cells, unspecialised cells, white blood cells, and can produce antibodies. It can also disposes of dead red and white blood cells. You can get red marrow and yellow marrow. The red marrow produces red blood cells and the ~~white~~ yellow marrow disposes of dead red blood cells and other waste products.

(Total for Question 7 = 10 marks)

4 marks awarded: Contains red bone marrow (1) and yellow bone marrow (1) produces red blood cells (1) white blood cells (1)

Question 8

This was a 8-mark question where candidates were asked to discuss three muscles types found within the equine body. Most leaners were able to offer a basic description of the muscle types, including where they are located but often struggled to provide more depth of knowledge and therefore remained in band 1. There were also some leaners who misinterpreted the question and wrote about different skeletal muscles, these leaners were also only awarded marks within band 1.



Discuss the **three** muscle types found in the equine body.

(8)

The three muscle types are Skeletal, Smooth and cardiac.

Skeletal muscles are found all around the body. they are striated which means they are ~~eperely~~ made up of small tubes called muscle fibres. Skeletal muscles are voluntry muscles as we do not need them.

Smooth muscles are found in organs, eg, lungs, intestine; they are non striated ~~because~~ the muscle is a different type. Smooth muscle is involuntry because we need to have it unlike skeletal muscles.

Cardiac muscles are in the heart to help it pump. cardiac muscle is striated, similar to skelletal. ~~and both~~ Cardiac muscle is involuntry because it is needed for the heart to be able to pump. ~~in the heart muscle is~~ in the heart there is a thick layre of muscle ~~aga~~ around the left ventrical as it pumps blood around the ~~whole~~ whole body where as there is only a thin layer around the right ventrical as it only pumps blood to the lungs and doesn't have as far to travel.

4 marks awarded. All three types of muscle identified and some technical knowledge demonstrated but limited information provided.

Summary

Based on their performance on this paper, learners should:

- Ensure the are familiar with all terminology from within the unit content.

Provide answers which are specific to the question, rather than generic answers, i.e naming soecific hormones rather than providing an overarchinf statement about the role of hormones

- Develop explain answers to allow the maximum number of marks to be awarded

- Provide answers for all questions. This paper had a significant number of questions where learners did not attempt an answer.

Based on the performance of this paper, centres should:

Ensure learners are famillair with the whole of the specification.