Examiners' Report
Lead Examiner Feedback

January 2021

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

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January 2021
31645H_2101_ER

Introduction

January 2021 was the seventh series of the new specification for Animal Management, when this mandatory unit has been assessed via an external assessment rather than via centre based internal assessment.

The question paper followed the format identified in the additional sample assessment materials published on the Pearson website.

The paper had seven questions. Each question was based on an area of the specification. Learners were required to demonstrate knowledge and understanding of a range of specification topics and to apply this knowledge to the specific question scenarios. The intention was to offer as broad coverage as possible for all areas of the unit content. Questions had varying weightings attached to them, with 1 to 3 marks for the lower demand questions and 4 to 8 marks for questions where an extended response was required.

The extended response, eight mark, questions were marked using a 'levels based' approach to assessment. The overall quality of the response was considered rather than the specific number of points gained.

There was also a focus on the use of suitable technical and vocational language and terminology within each response. The remainder of the questions on the paper were assessed using a range of indicative content and on the quality and clarity of the explanation provided.

Individual Questions

The following section considers each question on the paper, providing examples of popular learner responses and a brief commentary of why the responses gained the marks they did. This section should be considered with the live external assessment and corresponding mark scheme.

Question 1a

A good response demonstrated that the learner was able to recall the names of the missing groups of nutrients as per section A2.1 in the unit content.

1 There are seven types of nutrient that are important in an animal's diet.

(a) Complete the table below with the **two** missing groups of nutrients. (2)

Water
Fibre
Carbohydrates
Lipids
Proteins
Vitamins
Minerals

2 marks

The two correct groups of nutrients have been included in the table - 2 marks awarded.

A poor response:

1 There are seven types of nutrient that are important in an animal's diet.

(a) Complete the table below with the **two** missing groups of nutrients.

(2)

Sugar
Fibre
Carbohydrates
Lipids
Proteins
Vitamins
Calcium

0 marks

Two incorrect answers have been included- no rewardable marks.

Question 1b

A good response demonstrated that the learner was able to recall the name of the organ that makes bile from section A2.4 in the unit content.


(b) State the organ that makes bile.

(1)

Liver

1 mark

Liver correctly stated- 1 mark awarded.

A poor response:


(b) State the organ that makes bile.

(1)

Kidney

0 mark

'Kidney' is an incorrect answer and there were many similar incorrect responses seen- no rewardable mark.

Question 1c

This was a four mark question from section A2.3 of the unit content i.e. digestion in ruminants, with the learner required to demonstrate understanding of the processes involved.

A good response demonstrated knowledge of the ruminant's digestive system to gain four marks:

(c) Complete the table below to show the names and functions of the compartments of a ruminant's stomach.

(4)

Name of stomach compartment	Function
RUMEN	Process of fermentation involving bacteria and microorganisms
RETICULUM	Forms undigested food into balls of cud for regurgitation
Omasum	REABSORBS WATER AND SALTS
Abomasum	EXCRETES DIGESTIVE ENZYMES FOR FURTHER BREAKDOWN

4 marks
The correct names and functions identified – 4 marks awarded.

A poor response:

(c) Complete the table below to show the names and functions of the compartments of a ruminant's stomach.

(4)

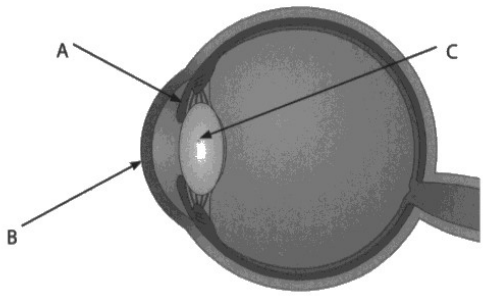
Name of stomach compartment	Function
molch	Process of fermentation involving bacteria and microorganisms
grezird	Forms undigested food into balls of cud for regurgitation
Omasum	Second Stomach
Abomasum	third stomach

0 marks
All answers are incorrect with no understanding of ruminant digestion demonstrated- no rewardable marks.

Question 2a

This was a memory recall question from section A3.4 of the unit content regarding the general structure of the eye.
A good response demonstrated that the learner was able to recall the names of the structures in the diagram for three marks.

2 The diagram shows the cross section of an eye.



Source: © metamorworks/Shutterstock

(a) Give the name of the structures labelled A, B and C.

(3)

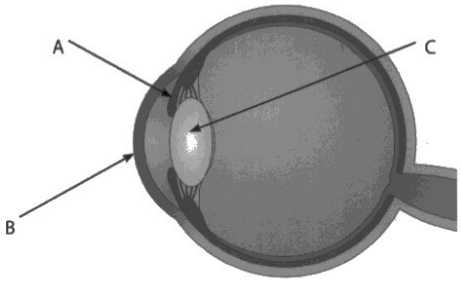
A Iris

B Cornea

C Lens

3 marks
The correct names of the structures given – 3 marks awarded.

A poor response:



Source: © metamorworks/Shutterstock

(a) Give the name of the structures labelled A, B and C.

(3)

A Optic nerve

B membrane

C Pupil

0 marks
Incorrect names given – no marks awarded.

Question 2b

This was a four mark question from section A3.4 of the unit content requiring the learner to demonstrate an understanding of sense organs. A good response identified the role of each sense organ and explained how it detected stimuli for four marks.

(b) Explain the role of the following sense organs in detecting stimuli. (4)

Ears

Ears detect sound through impulse neurones, this is good for hunting because it means that the animal can detect prey from a far distance. The sound also helps them detect where the prey is.

Whiskers

whiskers are sensitivity enable's animals to be guided better in the dark, meaning they can hunt during the day and night. They also detect vibrations, which helps them find stimuli.

4 marks

The correct role has been identified for each with accurate explanations provided – 4 marks awarded.

A poor response:

(b) Explain the role of the following sense organs in detecting stimuli. (4)

Ears

for detecting sound vibrations through the eardrum.

Whiskers

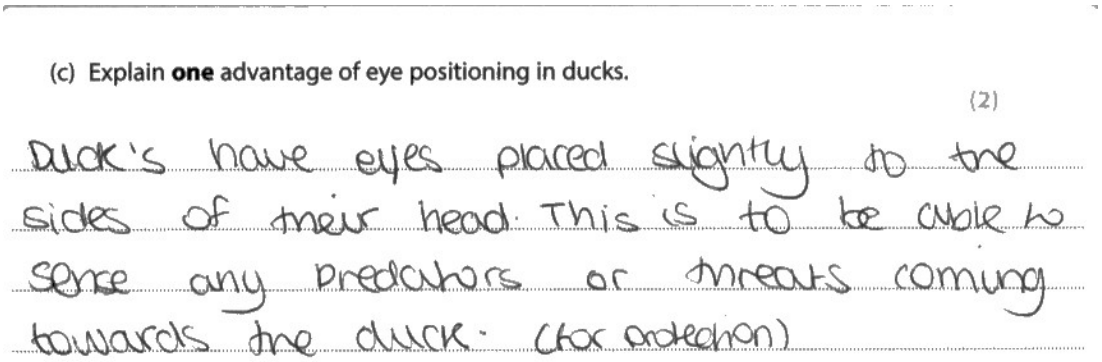
detects changes in the environment (air) because the whiskers are very sensitive

2 marks

Only the role of each sense organ identified with no explanation relating to detecting stimuli – 2 marks awarded.

Question 2c

This was a two mark question on eye positioning in ducks from section A3.7 of the unit content.
A good response identified the eye positioning and explained the advantage for two marks.

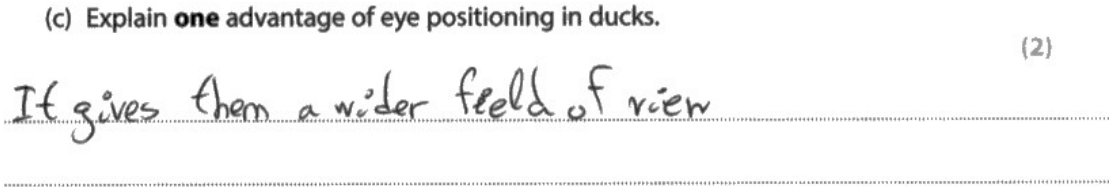

(c) Explain **one** advantage of eye positioning in ducks.

(2)

Duck's have eyes placed slightly to the sides of their head. This is to be able to sense any predators or threats coming towards the duck. (for protection)

2 marks
The eye position has been stated and the advantage explained– 2 marks awarded.

A poor response:


(c) Explain **one** advantage of eye positioning in ducks.

(2)

It gives them a wider field of view

1 mark
One advantage has been explained with no identification of where the eyes are positioned – 1 mark awarded.

Question 2d

A good response required the learner to state the two components of the central nervous system for 2 marks as per section A3.1 from the unit content.

(d) State the **two** components of the central nervous system.

(2)

1 Brain

2 spinal cord

2 marks
The two components of the central nervous system were correctly stated for 2 marks.

A poor response:

(d) State the **two** components of the central nervous system.

(2)

1 sensory

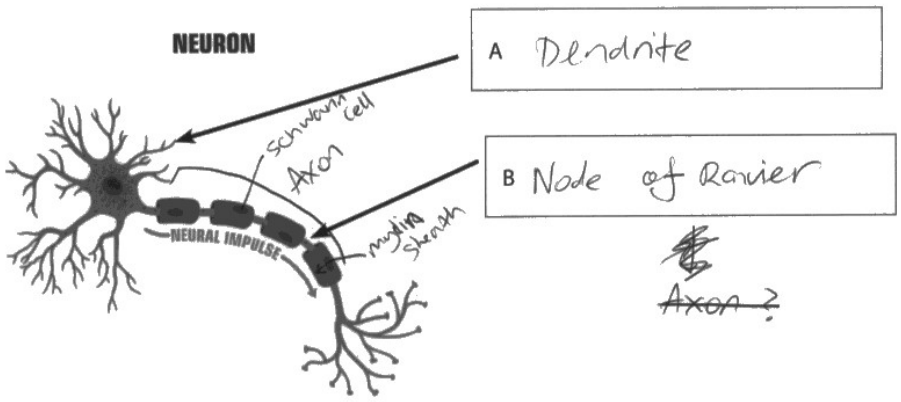
2 nerve

0 marks
This response does not answer the question and demonstrates no understanding - no rewardable marks available.

Question 3a

This was a two mark memory recall question from section B4.5i of the unit content and a good response correctly labelled the two structures of a neuron for two marks.

3 The diagram shows a neuron (nerve cell).



Source: © ShadeDesign/Shutterstock

(a) Label the structures A and B in the diagram.

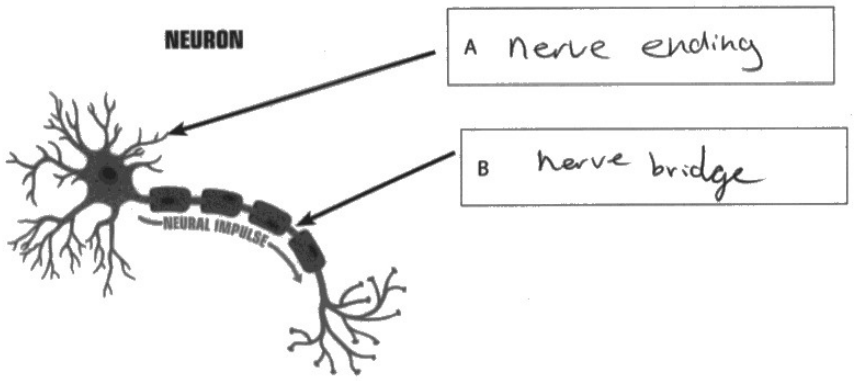
(2)

2 marks

The two correct structures of a neuron have been labelled for two marks.

A poor response:

3 The diagram shows a neuron (nerve cell).



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(a) Label the structures A and B in the diagram.

(2)

0 marks

Incorrect answers have been included on the diagram– no marks awarded.

Question 3b

A good response required the learner to demonstrate understanding of the role of a neurotransmitter from section B4.5iv of the unit content with a description identifying four marks from the mark scheme.

(b) Describe the role of a neurotransmitter.

(4)

Neurotransmitters, such as acetylcholine, are released and cause depolarisation. This triggers an action potential. This causes a response. Acetylcholine causes a gap to form. ~~and Ca^{2} binds to the gap.~~

The Acetylcholine triggers a response for 'normality'.
Noradrenaline triggers an 'emergency' response.

4 marks
This response demonstrates an understanding of the role of a neurotransmitter, identifying acetylcholine (1), depolarisation (1), action potential (1), gap (1) to be awarded 4 marks.

A poor response:

(b) Describe the role of a neurotransmitter.
nerve transmits signal?

(4)

A Neurotransmitter is a type of Neuron that ~~transmits~~ transmits signals to and from the brain wherever touch is used. It can also be used to measure Pain. For example, if someone stubs their toe, the neurotransmitter will send the signal of pain to the brain.

0 marks
This response is incorrect describing reaction to pain - no rewardable marks available.

Question 3c

A good response required the learner to describe two types of neurons as per section B4.5iii in the unit content for four marks.

(c) Describe **two** types of neuron.

(4)

1 Sensory neuron ~~is~~ are found in our finger tips and help us detect stimuli. For example, if you touch a hot pan it sends a message to the brain telling us it is hot.

2 Motor neuron sends signals to the brain to tell us to move away from danger. For example, if you touch a hot pan your hand will imediantly let go of it.

4 marks
Two types of neuron have been described using an example to be awarded four marks.

A poor response:

(c) Describe **two** types of neuron.

(4)

1 Motor neuron

2 Sensory neuron

2 marks
Two types of neuron have been identified for two marks but no description of each neurons has been included.

Question 3d

A two mark question on degenerative myelopathy in dogs from section A3.9 of the unit content which required the learner to describe the condition to achieve two marks.

(d) Describe degenerative myelopathy (DM) in dogs.

(2)

Degenerative myelopathy is when the neurons in the dogs body stop firing messages properly from nerve to nerve. Usually leading to the dogs back legs to working correctly leading them to be unable to use their back legs.

2 marks
A correct description as per marking points in the mark scheme to be awarded 2 marks.

A poor response:

(d) Describe degenerative myelopathy (DM) in dogs.

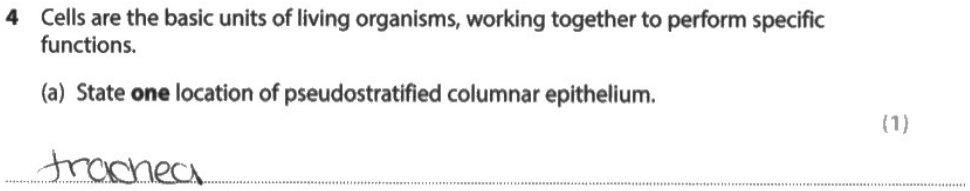
(2)

This is a deformity on the dogs spleen, and can cause the dog to have health problems and can cause the dog to ~~not grow properly~~. have a delay on their growth rate.

0 marks
An incorrect description of the condition – no rewardable marks available.

Question 4a

This was a one mark memory recall question on the location of pseudostratified columnar epithelium from section B4.3 in the unit content. A good response would have identified one of several locations listed in the mark scheme.



4 Cells are the basic units of living organisms, working together to perform specific functions.

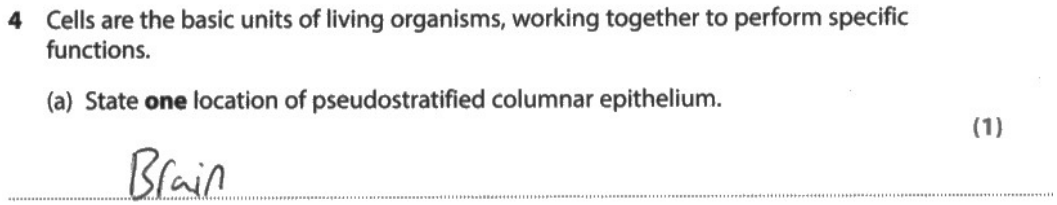
(a) State **one** location of pseudostratified columnar epithelium.

(1)

trachea

1 mark
A correct location has been stated for one mark.

A poor response:



4 Cells are the basic units of living organisms, working together to perform specific functions.

(a) State **one** location of pseudostratified columnar epithelium.

(1)

Brain

0 mark
'Brain' is an incorrect answer and there were many incorrect responses seen- no rewardable mark.

Question 4b

A good response required the learner to demonstrate their understanding of what skeletal muscle looked like by identifying descriptive points as per the mark scheme for three marks. The question is from section B4.6i in the unit content.

(b) Describe the appearance of skeletal muscle.

(3)

It is tubular and striated, with a few nuclei per cell.

3 Marks
A succinct response with three descriptive points as per the mark scheme – 3 marks awarded.

A poor response:

(b) Describe the appearance of skeletal muscle.

(3)

A skeleton is made primarily of two parts - core and limbs. The top/front being the skull, moving down to the spine/vertical collum, which is also made up with the rib cage. Branching off the core are the limbs, connected at ball and socket joints at the top/shoulders connect the arm. From the pelvis at the base of the vertibrae the legs are connected.

0 marks
This response does not answer the question - no rewardable marks available.

Question 4c

This was a one mark memory recall question requiring the learner to know the name of the molecule that stores energy from section B4.6iii in the unit content.
A good response would have identified ATP for one mark.

(c) Give the name of the molecule that stores energy.

(1)

ATP

1 mark
The correct name given for one mark.

A poor response:

(c) Give the name of the molecule that stores energy.

(1)

Minerals

0 mark
'Minerals' is an incorrect answer and there were many incorrect responses seen- no rewardable mark.

Question 4d

This four mark question required the learner to demonstrate an understanding of slow twitch muscle fibres which is from section B4.6ii in the unit content.
A good response identified two features and explained each one as per the possible answers in the mark scheme to gain four marks.

(d) Explain **two** features of slow twitch muscle fibres.

(4)

1 They are darker in colour due to the high amount of capillaries needed for oxygen diffusion from aerobic respiration

2 They contract slowly, but can ~~fast~~ contract. for a longer time, meaning they are useful for long distance running, ie ~~w~~ in wolves

4 marks
Two correct features have been identified and explained to gain 4 marks.

A poor response:

(d) Explain **two** features of slow twitch muscle fibres.

(4)

1 They are stronger and larger the other muscles and dont cause as much damage to themselve

2 They are to slow and cannot be used in urgent respon

0 marks
This response is incorrect – no rewardable marks.

Question 4e

A good response to this three mark question from section B2.1 of the unit content required the learner to demonstrate an understanding of how to prepare a sample of tissue to look at under the microscope, as per the descriptive points in the mark scheme to achieve three marks.

(e) Describe how to prepare a sample of tissue to look at under a microscope.

(3)

Firstly You would peel a thin layer of tissue off and then Place on to a glass slide then you would put a drop of iodine / or colouring on the tissue Sample to make the tissue's cells more visible and then place another glass side on top

(Total for Question 4 = 12 marks)

3 marks
A complete description of the process to achieve three marks.

A poor response:

(e) Describe how to prepare a sample of tissue to look at under a microscope.

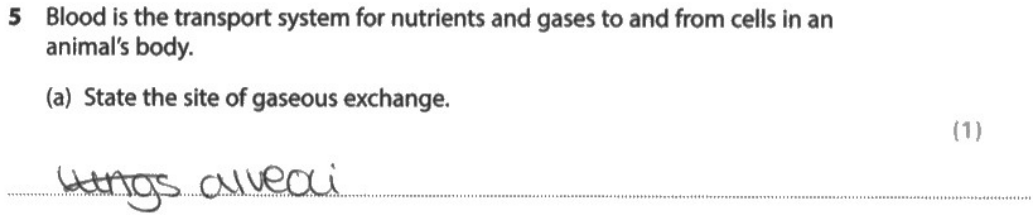
(3)

To prepare a sample of tissue, you need to have tissue at hand to use. Then sanitise the tissue and place in viewing discs under a microscope.

0 marks
An inaccurate description of the process – no rewardable marks.

Question 5a

This was a one mark memory recall question requiring the learner to know where gaseous exchange takes place from section A4.10 in the unit content. A good response would have identified the Alveoli or Lungs for one mark.



5 Blood is the transport system for nutrients and gases to and from cells in an animal's body.

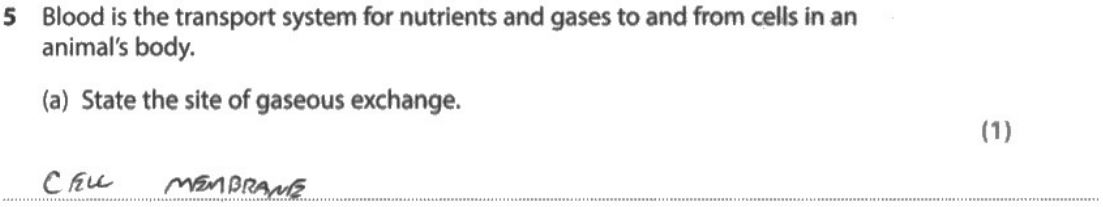
(a) State the site of gaseous exchange.

(1)

lungs alveoli

1 mark
The correct site stated for one mark.

A poor response:



5 Blood is the transport system for nutrients and gases to and from cells in an animal's body.

(a) State the site of gaseous exchange.

(1)

CELL MEMBRANE

0 mark
'Cell membrane' is an incorrect answer and there were many incorrect responses seen- no rewardable mark.

Question 5b

This four mark required the learner to demonstrate understanding of the processes involved in inhalation from section A4.8 of the unit content.
A good response described the processes from the list in the mark scheme to achieve four marks.

(b) Describe the processes involved in inhalation in mammals.

(4)

During inhalation, oxygen is taken in through the respiratory system. The lungs ~~volume~~ Thoracic volume increases and the lung pressure decreases. The intercostal muscles ~~and~~ aid this process, when you inhale the ribs and the ~~and~~ diaphragm contract allowing the lungs to expand and take in as much Oz as possible.

4 marks
A complete description of the processes to be awarded four marks for, thoracic volume increases (1), lung pressure deceases (1) intercostal muscles (1) diaphragm contracts (1).

A poor response:

(b) Describe the processes involved in inhalation in mammals.

(4)

Mammals breath through their mouths or noses by respiration. Respiration is taking in oxygen and transporting it into the blood then around the body. 2 types of respiration is aneerobic and aerobic respiration. Aerobic respiration doesn't require energy whereas an aerobic respiration requires ATP energy.

0 marks
An incorrect answer – no rewardable marks.

Question 5c

A good response to this two mark question from section A4.13 in the unit content required the learner to identify a role of the lymphatic system and explain it for two marks.

(c) Explain the role of the lymphatic system in immunity.

(2)

The role of the lymphatic system in immunity is to help produce white blood cells, antibodies to fight off any disease or infection.

2 marks
The role of the lymphatic system in immunity has been correctly identified and explained– 2 marks awarded.

A poor response:

(c) Explain the role of the lymphatic system in immunity.

(2)

The lymphatic system helps fight off ~~diseases~~ viruses and bacterial illnesses.

1 mark
One mark awarded for identification of the role but no explanation given.

Question 5d

This was the first of two competency based questions with marks awarded for the response being at Level 1, Level 2 or Level 3. If no rewardable material was evident the learner scored 0 marks. There was a tendency to describe the cardiac cycle and not discuss the double circulatory system. A Level 3 response required mostly accurate and detailed knowledge of a double circulatory system with clear links to the advantages as suggested in the indicative content in the mark scheme.

(d) Discuss the double circulatory system, including its advantages.

(8)

Blood is pumped twice in one session; blood is pumped to both the lungs (deoxygenated) and the entire body (oxygenated).
double circuit as one circuit is from heart to lungs to heart, ~~while~~ in order to oxygenate blood that diffused oxygen to other organs/ body in the previous circuit. ~~And~~ The other circuit is from heart, to the body ~~and back~~ in order for organs to be ~~replenished~~ replenished with oxygen, and back to the heart in order for the deoxygenated blood to switch to the other circuit in order to be oxygenated again before switching back to the previous circuit and so on.

An advantage is that both circuits work in tandem/together to reduce energy consumption and increase efficiency of maintaining oxygen/CO_2 levels within the blood stream and the rest of the organs. If both circuits went one after another instead of together, then it will take more time for oxygen and CO_2 to be diffused in/out of the body, in which most organs dependant on rich oxygen supplies will work at half the speed/efficiency, especially the heart which has the first amount of oxygen after diffusing from lungs

8 marks

This response demonstrates accurate knowledge of the processes involved in a double circulatory system through a well-developed, logical discussion which includes relevant points and an explanation of its advantages.
This is a Level 3 answer which was awarded 8 marks.

A poor response:

(d) Discuss the double circulatory system, including its advantages.

(8)

One advantage of a double circulatory system is that good/nutrients can be broken down much ~~all~~faster, due to the high metabolic rate; and ~~there~~ ~~per~~

Another advantage is ~~that~~ that due to the high metabolism, energy can be produced much faster and much more eggiciently.

0 marks

This learner has attempted the question but confused the circulatory system with the digestive system. There are therefore no rewardable marks available.

Question 5e

This question from section A7.4 of the unit content required the learner to describe symptoms of Hypothermia and Hyperthermia as per the list in the mark scheme for four marks.

(e) Describe symptoms of the following disorders. (4)

Hypothermia is when the body temperature gets to low, therefore symptoms in ~~animals~~ mammals include shivering and being cold to touch.

Hyperthermia is when the body temperature is too high, therefore symptoms include panting and being fatigue.

4 marks
A correct description of the symptoms for both disorders has been provided to be awarded four marks.

A poor response:

(e) Describe symptoms of the following disorders. (4)

Hypothermia Too warm

Hyperthermia numb fingers, toes, ~~ears~~ and nose - cant feel them as the body is keeping vital organs safe. very cold

0 marks
The symptoms are the wrong way round resulting in an incorrect answer – no rewardable marks.

Question 6a

This question is from section A7.1 in the unit content and required the learner to analyse the information they knew about normal temperature ranges in mammals and birds to explain the difference between them to be awarded four marks.
There was no evidence of a four mark response seen.

6 Endothermic animals maintain their body temperature.

(a) Explain the difference in temperatures of mammals and birds.

(4)

Mammals are endothermic and are able to maintain their temperature through homeostasis, the average temperature for mammals can be between 36 - 40°C. Dogs are between 37 - 39°C.

Birds migrate to avoid harsh weather conditions and have a counter current mechanism in their legs. This is when oxygenated blood warms the deoxygenated blood, reducing heat loss. Birds are echothermic. They use feathers to keep warm. Chickens are between 40 - 43°C.

3 marks
This response demonstrates an understanding of both Mammals and Birds' temperatures but has not fully explained the difference between the two being related to their rates of metabolism and was awarded three marks.

A poor response:

6 Endothermic animals maintain their body temperature.

(a) Explain the difference in temperatures of mammals and birds.

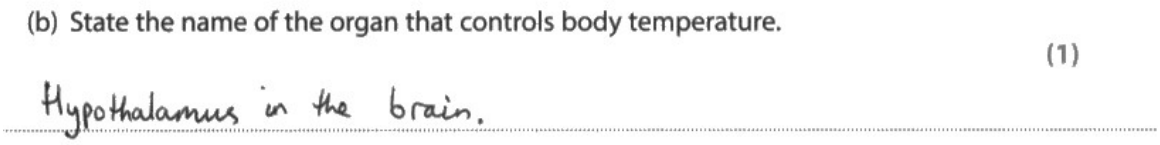
(4)

Birds have a ~~higher~~ lower body temperature than mammals because they have a lower blood density

0 marks
An incorrect answer – no rewardable marks.

Question 6b

This was a one mark memory recall question requiring the learner to know the name of the organ that controls body temperature from section A7.2 in the unit content.


(b) State the name of the organ that controls body temperature.

(1)

Hypothalamus in the brain.

1 mark
'Hypothalamus' is the correct response to score 1 mark.

A poor response:


(b) State the name of the organ that controls body temperature.

(1)

Kidneys

0 marks
'Kidneys' is an incorrect response and there were many incorrect responses seen- no rewardable mark.

Question 6c

This four mark question from section A7.3i in the unit content required the learner to demonstrate understanding of evaporative cooling mechanisms to explain two ways animals lose heat for four marks.

(c) Explain **two** ways animals lose heat.

(4)

1 Through vasodilation which causes arterioles to expand. This increases the surface area and allows for more blood, enabling heat loss. This is because more blood is closer to the skin.

2 Sweating, the evaporation of sweat cools the animal down. Sweating can be through paws.

4 marks
A complete accurate response as per the mark scheme to achieve the full four marks.

A poor response:

(c) Explain **two** ways animals lose heat.

(4)

1 Animals ~~hypothermia~~ lose heat when they are asleep because their blood is being pumped round slower.

2 If an animal has ~~with~~ hypothermia they will loose heat due to them having a fever.

0 marks
This response does not answer the question – no rewardable marks.

Question 6d

A good response to this two mark question from section C1.3 in the unit content required the learner to demonstrate understanding of the distinguishing features of the vertebrate class Pisces to be awarded two marks.

(d) State **two** features that distinguish Pisces from other vertebrate classes.

(2)

1 Gills to breath insted of lungs

2 They live ~~water the~~ in water all of the time and can't 'breath' out of water

2 marks
An accurate response as per the mark scheme achieving the full two marks.

A poor response:

(d) State **two** features that distinguish Pisces from other vertebrate classes.

(2)

1 cold blooded

2 lay their eggs in the water

0 marks
This response is incorrect– no rewardable marks.

Question 7

This was the second competency based question and the last question on the paper which had eight available marks awardable for the overall accuracy, detailed knowledge and understanding plus a well-developed discussion with relevant points about the principles of natural selection. It is from section C1.2 of the Unit Content and allowed the learner to discuss examples of species being affected by selective pressures leading to variations and natural selection of the best adapted to survive.

7 Animals can adapt to different environments over time.

Discuss the principles of natural selection in animals.

(8)

Variations lead to adaptations which could lead to speciation.
Natural Seledion This leads to evolution over a long period of time. | Anatomical Physiological Behavioural

- Phylogenetic trees allow us to see evolutionary relationships looking at DNA and physical traits from ancestors and descendants.

Charles Darwins theory of evolution is a process of which and animal/species is able to reproduce successfully and pass on genetic make-up - The sole purpose of animals. Changes to the enviroment may affect this process. and cause adaptations in the forms of anatomical, physiological and behavioural. We get to this stage through variation. This is a survival product giving a specific individual an advantage ove the others. For example, one giraffes neck maybe slighty longer which allows that giraffe the opperlunity for fresher and more nutritious food sources.

8 marks

This response demonstrates accurate knowledge of the principles of natural selection with good examples logical discussed and linked to the survival of the species over time.

This is a Level 3 answer which was credited with 8 marks.

A poor response:

7 Animals can adapt to different environments over time.

Discuss the principles of natural selection in animals.

(8)

There are different animals that can live in both hot and cold environments. A seal is an example of this as you can find seals in frozen areas, and in hot clear areas. A seal is adapted to live in both really cold and really hot conditions and environments as they have thick muscle and fatty tissues to keep them well insulated in the cold, frozen environments to prevent them from losing there heat. The fatty tissues are like a thick wall all around the body which generates heat whilst in the cold environment. A seal can also adapt to hot environments as a seal has sweat glands which will prevent them from over heating due to the thick muscles and fatty cells.

0 marks

This response does not answer the question regarding 'natural selection', the learner has focused on the stem of the question regarding 'adapting to different environments' and not related selection pressures leading to variation and natural selection over time.

Summary

Based on the performance on this paper learners should:

- Be familiar with the function / role / location of organs and tissues and components of the body systems. Know the effect of a named disease on the body from the unit content.
- Be able to differentiate between fast and slow twitch muscles.
- Know the processes involved in inhalation and the lymphatic system.
- Know the temperature difference between mammals and birds and understand the reason.
- Differentiate between nerve impulses and neurons, separate to receptors and sense organs.
- Know all the structures in the eye and their functions.
- Know names of hormones and their functions.
- Read the question to ensure the answer given reflects what has been asked i.e. the 'appearance' not 'function' of skeletal muscle.
- Be familiar with all body systems and understand the advantages of different systems in different species i.e. the ruminant digestive system and the double circulatory system.
- Practice the levels-based, extended response questions to ensure a Level 3 answer includes a well-developed and logical discussion with accurate knowledge relevant to the context of the question, plus clear links which consider a range of different aspects and inter-relationships with body systems. This will then gain the 6-8 marks for each of the two levels-based questions included in the paper.
- Responses should be based on the command verb in the question i.e. 'state' / 'give' do not require expansion of a point but 'explain' / 'describe' do.
- Identify the marks allocated to the question and the space available to guide the extent of the response required and ensure the answer is included in the appropriate point / label.
- Practice papers from previous series to become familiar with the content and style of questions asked.