Examiners' Report
Lead Examiner Feedback

June 22

Pearson BTEC Nationals
In Animal Management (31646H)
Unit 2: Animal Biology

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Introduction

June 2022 was the eighth 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 marks, 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

Q1 (a)

A good response demonstrated that the learner was able to recall the names of the missing groups of taxonomic classification from section C3.1i in the unit content.

1 Animals are classified into groups to identify them.

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

Kingdom
Phylum
class
Order
Family
Genus
Species

2 marks

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

A poor response:

1 Animals are classified into groups to identify them.

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

Kingdom
Amphibian
mammal
Order
Family
Genus
Species

0 marks
Two incorrect answers have been included- no rewardable marks.

Q1 (b)
A good response demonstrated that the learner was able to recall the name of one chamber found in the heart from section A4.3 in the unit content.

Animals are made up of cells, tissues and organs.

(b) State the name of **one** chamber found in the heart.

Right atrium

1 mark
One chamber correctly stated- 1 mark awarded.
A poor response:

Animals are made up of cells, tissues and organs.

(b) State the name of **one** chamber found in the heart.

Artery

0 mark
'Artery' is an incorrect answer - no rewardable mark.

Q1 (c)
This was a four-mark question from section B4.3/4/5/6 of the unit content i.e. Function of the four tissue types.
A good response:

(c) Complete the table to show the names and functions of tissue types. (4)

Name of tissue type	Function
Epithelial	Protects and absorbs
Connective	Connects bones and cartilage
Nervous	Conducts impulses
muscular	Allows movement

4 marks

Correct functions and tissue types included in the table – 4 marks awarded.

A poor response:

(c) Complete the table to show the names and functions of tissue types. (4)

Name of tissue type	Function
Epithelial	To control all tissue on the surface
Connective	To control all muschular tissue
muscular	Conducts impulses
~~Ske~~ Skeletal	Allows movement

0 marks

No marks awarded for incorrect functions and tissue types.

Q2 (a)

This was a memory recall question from section A1.2 of the unit content regarding mammalian bones of the skeleton for three marks.
A good response:

2 The diagram shows the skeleton of a rabbit.

(Source: © Cee_Aye/Shutterstock)

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

(3)

A Ribcage

3 marks

The three correct bones given – 3 marks awarded.
A poor response:

2 The diagram shows the skeleton of a rabbit.

(Source: © Cee_Aye/Shutterstock)

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

(3)

A Cover bone

B Ribs

0 marks

This response missed out on two marks by incorrectly identifying ‘ribs’ and ‘phemur’ / putting them on the wrong answer lines. Phonetic spellings were accepted for correct responses.

Q2 (b)

A two mark 'describe a ligament' question from section A1.2i of the unit content.

A good response:

(b) Describe a ligament. (2)

A ligament is a type of connective tissue thats main role is to connect two bones together. These are commonly seen at joints around the body.

2 marks

A correct description as per the mark scheme – 2 marks awarded.

A poor response:

(b) Describe a ligament. (2)

When a rabbit bounces up and down the ligaments become stretched when this happen the muscles stretch. has the rabbit moves ~~the~~ ~~the~~ the ~~ligament~~ ligaments slide past each other so when one goes up the other comes down.

0 marks

An incorrect response - no rewardable marks.

Q2 (c)

This was a two-mark memory recall question on the function of the epidermis from section A1.3i of the unit content.

A good response:

(c) Give **two** functions of the epidermis. (2)

1 Protection from the environment, like pathogens.

2 Allows for secretion of many glands to reach the external environment. Example sweat glands.

2 marks

Two correct functions given– 2 marks awarded.

A poor response:

(c) Give **two** functions of the epidermis. (2)

1 helps recover the body

2 Controls the body temperture.

0 marks

Two incorrect functions given- no marks awarded.

Q2 (d)

A four mark 'explain' question about types of feather from section A1.3ii of the unit content

A good response required an identification of function for each feather type with associated expansions:

(d) Explain the function of types of feather:

Down

down feathers are soft and fluffy. They help insulate the bird and keep in warmth.

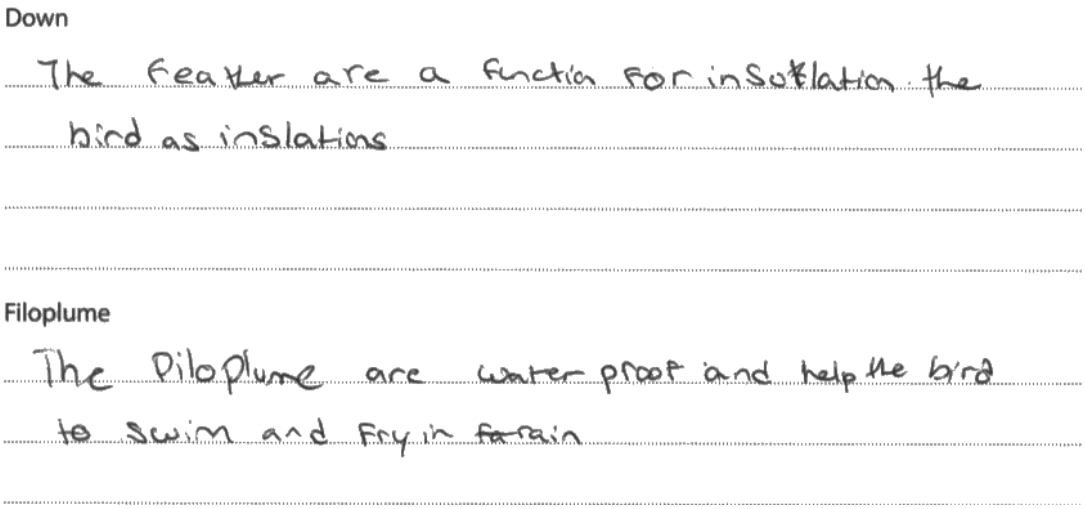
Filoplume

filoplume are very small feathers that are underneath all other feathers. They attatch to nerve endings and send the brain ~~electric~~ electrical impulses about the feather alignment.

4 marks

Four marking points from the mark scheme included in this response for full marks.

A poor response:



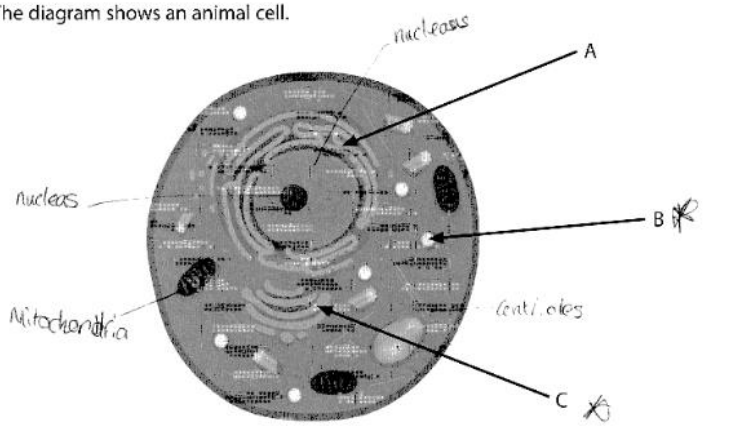
1 mark

The first identification of 'insulation' is correct to be awarded 1 mark but there is no expansion explaining that it is for 'warmth'. The answer given for 'Filoplume' is incorrect'- only 1 rewardable mark.

Q3 (a)

This was a three-mark memory recall question from section B1.1 of the unit content on cell organelles and a good response correctly named the three organelles for three marks:

3 The diagram shows an animal cell.



(Source: © Pearson Asset Library)

(a) State the name of the organelles labelled A, B and C in the diagram.

(3)

A Rough Endoplasmic reticulum

B Lysosomes

C Golgi aparatus

3 marks

All three organelles correctly named- 3 marks.

0 marks

All organelles incorrectly identified- no marks awarded.

Q3 (b)

A good response required the learner to demonstrate understanding of the fluid mosaic model of the plasma membrane from section B1.1 of the unit content, with a description identifying four marking points from the mark scheme.

(b) Describe the fluid mosaic model of the plasma membrane.

(4)

The fluid mosaic model is ~~is~~ that the plasma membrane is made up of phospolipids. These phospolipids are made of a hydrophilic head, meaning they're attracted to water and hydrophobic tails / Legs, meaning they're repulsed by water. The phospholipids are structured in a bi-Layer, meaning there are two layers.

4 marks

This response demonstrates an understanding of the fluid mosaic model of the plasma membrane with the first three marking points in the mark scheme included to be awarded 4 marks.

A poor response:

(b) Describe the fluid mosaic model of the plasma membrane.

(4)

Plasma membrane is there to protected the cell from any bacteria getting inside, the fluid mosaic model is formed by the genetic endoplasmic cells that create glucose for the animals cell, the glucose creates a large amount of energy that helps to fight off the bacteria trying to get into the cell.

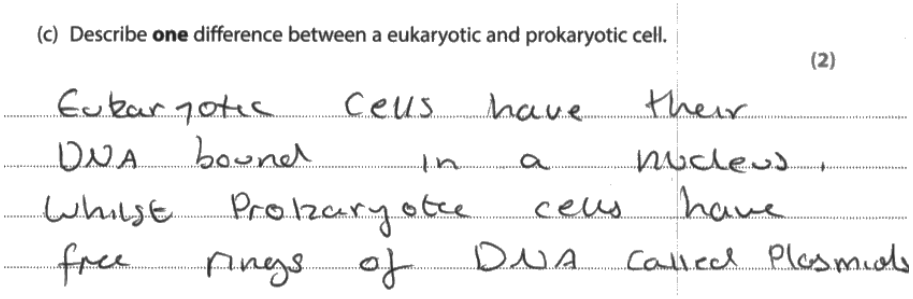
0 marks

This response is incorrect, demonstrating no understanding of the processes involved - no rewardable marks available.

Q3 (c)

This two mark 'describe one difference' question was from section B2.3 in the unit content and required the difference between the two types of cells to be identified with a linked description of the other cell.

A good response:


(c) Describe **one** difference between a eukaryotic and prokaryotic cell.

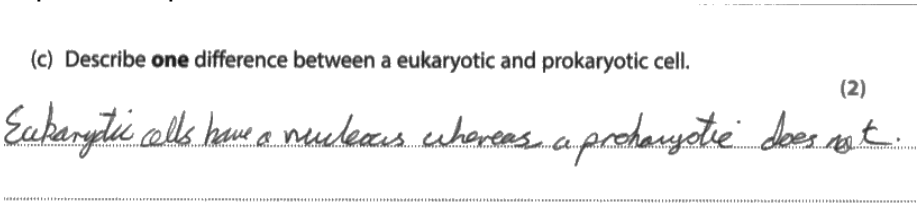
(2)

Eukaryotic cells have their DNA bound in a nucleus, whilst Prokaryotic cells have free rings of DNA called Plasmids

2 marks

The difference has been identified as having / not having a nucleus with a description of each cell as per the second marking point in the mark scheme – 2 marks awarded.

A poor response:


(c) Describe **one** difference between a eukaryotic and prokaryotic cell.

(2)

Eukaryotic cells have a nucleus whereas a prokaryotic does not.

1 mark

This response was commonly seen where the learner has correctly identified that a eukaryotic cell has a nucleus for 1 mark but has not described the difference in a prokaryotic cell.

Q3 (d)

A three-mark question to describe 'simple diffusion' from section B3.4ii of the unit content which required an understanding of the process to achieve the full three marks.

A good response:

(d) Describe simple diffusion. (3)

Simple diffusion is the net movement of particles from a high to low concentration. This movement happens until equilibrium is reached, where the concentration is even. This can be oxygen moving from a high concentration to a low concentration in the lungs.

3 marks

A correct description as per the first three marking points in the mark scheme to be awarded 3 marks.

A poor response:

(d) Describe simple diffusion. (3)

simple diffusion is the transportation of water from the body making its way out, such as through the skin. Diffusion has to make its way through the three layers of the skin epidermis, dermis and hypodermis

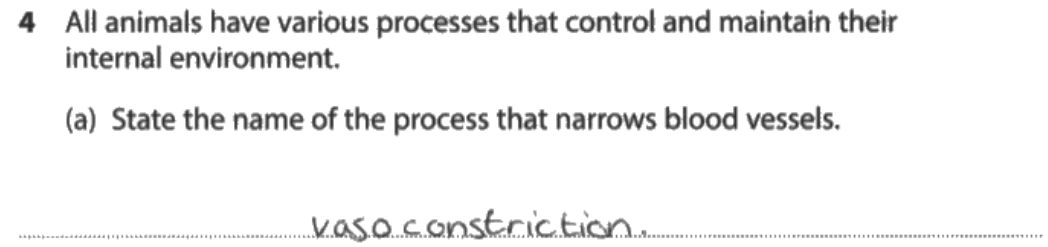
0 marks

An incorrect description demonstrating no understanding – no rewardable marks available.

Q4 (a)

A 1-mark question which required an understanding of a process involved in thermoregulation from section A7.3vii of the unit content.

A good response:



4 All animals have various processes that control and maintain their internal environment.

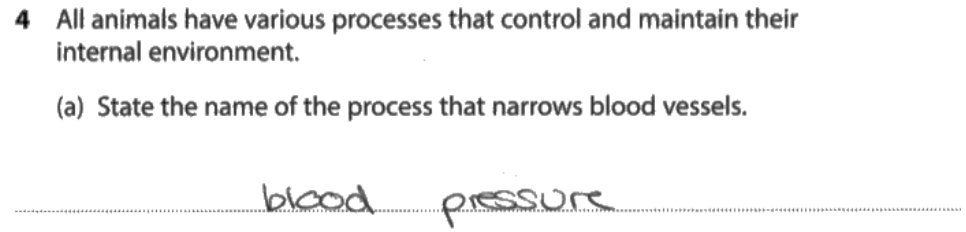
(a) State the name of the process that narrows blood vessels.

vaso constriction.

1 mark

The name of the process has been accurately stated – 1 mark awarded

A poor response:



4 All animals have various processes that control and maintain their internal environment.

(a) State the name of the process that narrows blood vessels.

blood pressure

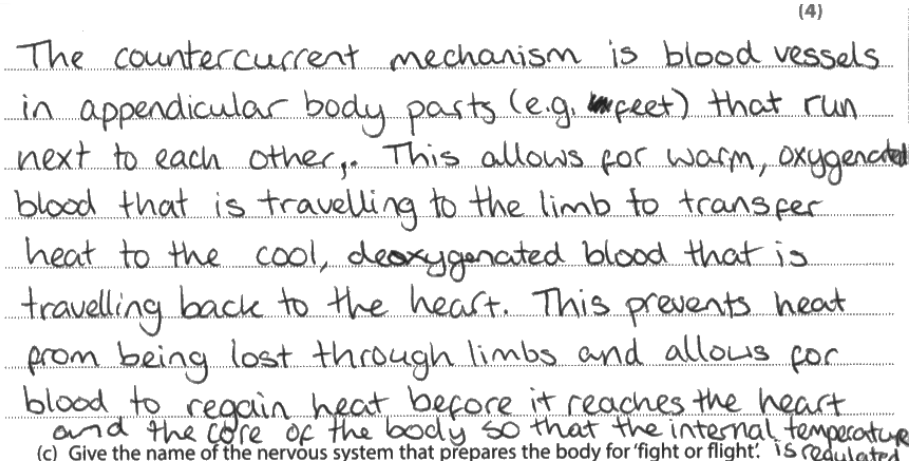
0 mark

An incorrect response -no rewardable mark.

Q4 (b)

This 4-mark question required an understanding of the counter current mechanism from section A7.3viii of the unit content.

A good response:


(4)

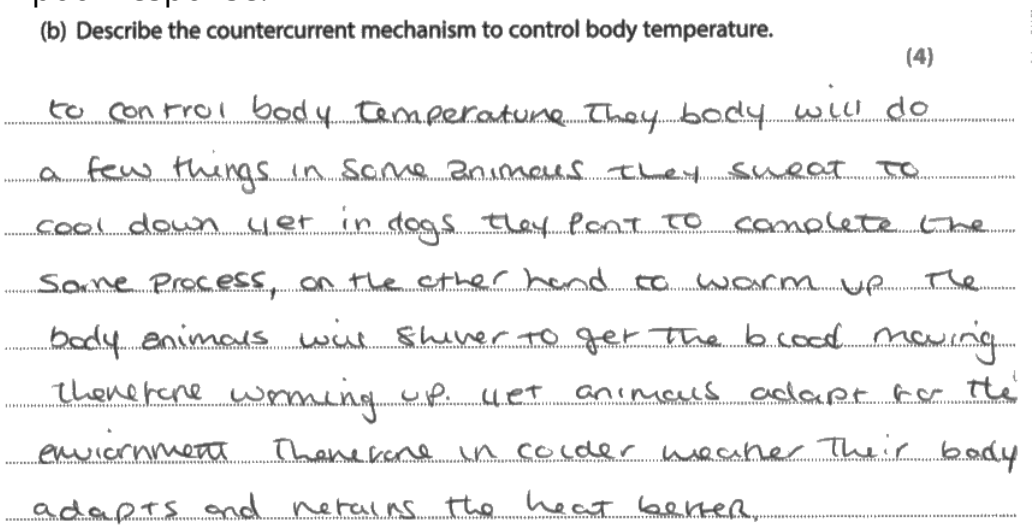
The countercurrent mechanism is blood vessels in appendicular body parts (e.g. feet) that run next to each other,. This allows for warm, oxygenated blood that is travelling to the limb to transfer heat to the cool, deoxygenated blood that is travelling back to the heart. This prevents heat from being lost through limbs and allows for blood to regain heat before it reaches the heart and the core of the body so that the internal temperature is regulated

(c) Give the name of the nervous system that prepares the body for 'fight or flight'.

4 Marks

A good complete response clearly describing the mechanism as per marking points in the mark scheme, 4 marks awarded.

A poor response:


(b) Describe the countercurrent mechanism to control body temperature.

(4)

to control body temperature they body will do a few things in some animals they sweat to cool down wet in dogs they pant to complete the same process, on the other hand to warm up the body animals will shiver to get the blood moving therefore warming up. wet animals adapt for the environment therefore in colder weather their body adapts and retains the heat better.

0 marks

There were many incorrect responses seen where there was no understanding of the mechanism demonstrated and no rewardable marks available.

Q4 (c)

This was a one-mark memory recall question requiring the learner to know the different nervous systems from section A3.2 in the unit content.

A good response:

(c) Give the name of the nervous system that prepares the body for 'fight or flight'.

Sympathetic nervous system

1 mark

The correct name given – 1 mark awarded.

A poor response:

(c) Give the name of the nervous system that prepares the body for 'fight or flight'.

(1)

Adrenaline

0 mark

'Adrenaline' is not the nervous system- no rewardable mark.

Q4 (d)

This two-mark question required the learner to demonstrate an understanding of brown adipose tissue from section A7.3iv in the unit content.

A good response:

Brown adipose tissue is found in many endothermic animals. It contains lipids (fats) and is used to control body temperature. It is used by the body in response to a lower external temperature. The body runs the brown adipose tissue through the mitochondria in the cells. This generates heat and energy which is used to warm the body up.

2 marks

A complete explanation to be awarded 2 marks.

A poor response:

(d) Explain the role of brown adipose tissue.

(2)

brown adipose tissue is used to insulate the body

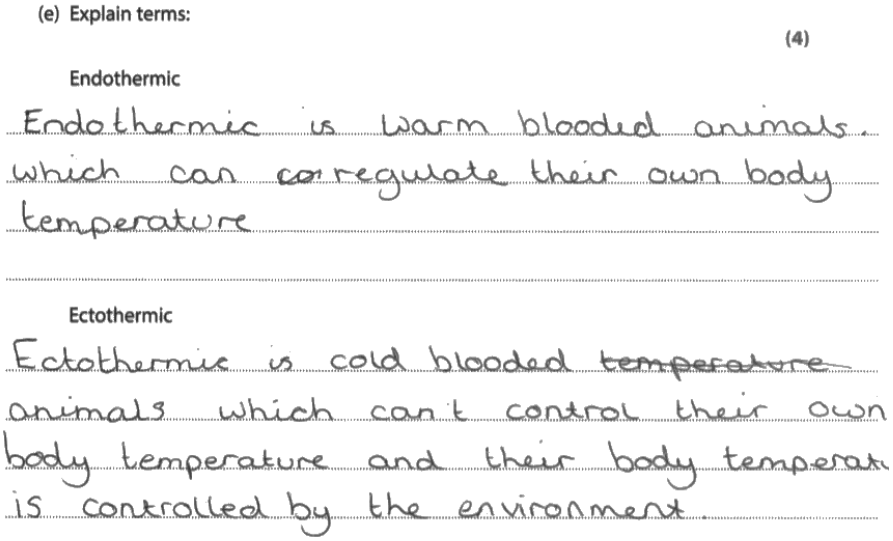
0 marks

This response is incorrect and there were a lot that referred to 'insulation'– no rewardable mark.

Q4 (e)

A four-mark question to explain the terms endo and ecto thermic which required an identification and expansion for each to be awarded 4 marks.

A good response:


(e) Explain terms:

(4)

Endothermic

Endothermic is warm blooded animals. which can coregulate their own body temperature

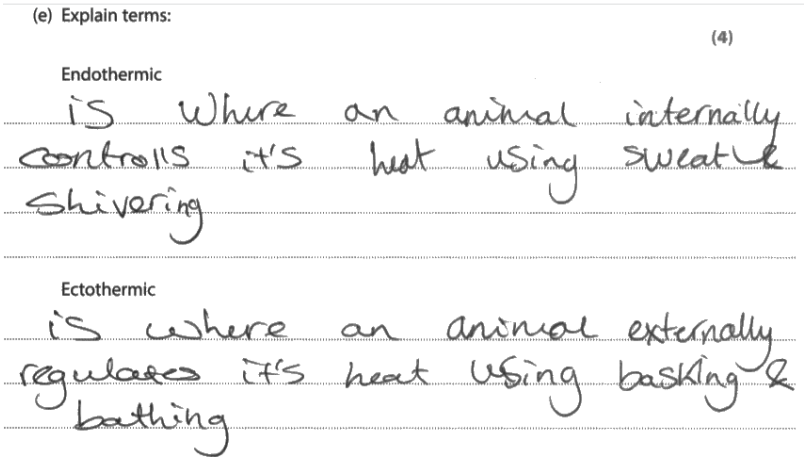
Ectothermic

Ectothermic is cold blooded ~~temperature~~ animals which can't control their own body temperature and their body temperat is controlled by the environment.

4 Marks

Identification of warm/cold blooded and appropriate expansion of each to be awarded 4 marks.

A poor response:


(e) Explain terms:

(4)

Endothermic

is where an animal internally controlls it's heat using sweat & shivering

Ectothermic

is where an animal externally regulates it's heat using basking & bathing

2 Marks

Two expansions have been given with no identifications – 2 marks awarded.

Q5 (a)

A straightforward one-mark memory recall question from section A5.1iv in the unit content.

A good response:

5 Reproduction is important for the survival of all living things.

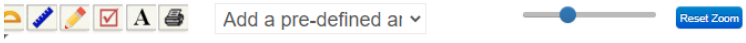
(a) State the length of the gestation period of a rabbit. **(1)**

32 days

1 mark

A correct response – 1 mark awarded

A poor response:



5 Reproduction is important for the survival of all living things.

(a) State the length of the gestation period of a rabbit. **(1)**

24 hours

0 mark

Responses varied with guesses as above up to 4 years. No rewardable mark.

Q5 (b)

This was a four mark 'explain' question on the role of two reproductive hormones from section A5.1ii of the unit content.

A good response:

(b) Explain the role of **two** hormones released by the ovaries. **(4)**

1 oestrogen is used to rebuild the ~~lining~~ lining of the uterus (endometrium) after menstruation

2 progesterone is used to maintain the inner lining of the uterus throughout the oestrus cycle

4 marks

Two correct hormones identified with accurate roles explained – 4 marks awarded

A poor response:

(b) Explain the role of **two** hormones released by the ovaries.

(4)

1 Oestrogen - this is the main female hormone and prepares the body for the oestrous cycle.

2 FSH -

1 mark

One correct hormone identified but the role is not specific as an expansion – 1 mark awarded

Q5 (c)

This two-mark question from section A5.1i required a description of the placenta which included any of the marking points in the mark scheme.

A good response:

(c) Describe the placenta.

(2)

A rich blood tissue found below the uterus that provides nutrients to a foetus/embryo. Only is found during pregnancy.

2 marks

This response is as per the marking points 3 and 6 in the mark scheme -2 marks awarded.

A poor response:

(c) Describe the placenta.

(2)

A placenta is an organ that develops during pregnancy, it provides the correct amount of nutrients for the embryo.

1 mark

One mark awarded for 'provides nutrients', another descriptive point needed for the second mark.

Q5 (d)

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 muscle contraction and not mention the theory in a discussion.

A Level 3 response required mostly accurate and detailed knowledge of the processes involved in the sliding filament theory of muscle contraction with clear links to demonstrate understanding of the sequence as suggested in the indicative content in the mark scheme.

(d) Discuss the sliding filament theory of muscle contraction.

(8)

when a muscle is relaxed, the protein tropomyosin blocks the myosin binding sites on actin. A muscle contracts when it recieves a nerve impulse in the form of action potential. This opens the calcium channels in the sarcoplasmic reticulum, which releases calcium ions into the myofibril to bind with troponin. Troponin changes shape, which moves tropomyosin, exposing binding sites. Myosin head attaches to binding site on actin. This creates a cross-bridge. The myosin head pulls the actin filament towards the centre of the sarcomere. This releases ADP and Pi (phosphate). ATP (energy molecule) attaches and breaks cross-bridge, where myosin head detaches from the binding site on actin. Myosin moves back to its original place and ATP hydrolises into ADP + Pi so another cross bridge can form. Once action potential is over, calcium ions are pumped back into sarcoplasmic

8 marks

This response demonstrates accurate knowledge of the processes involved in the sliding filament theory of muscle contraction through a well-developed, logical discussion which includes relevant points with clear links to the context of the question.
This is a Level 3 answer which was awarded full 8 marks.

A poor response:

(d) Discuss the sliding filament theory of muscle contraction.

(8)

ATP provides the energy for this process and once it is used up, it becomes ADP and a phosphate atom.

1 mark

This response demonstrates isolated elements of knowledge i.e. 'ATP in process then becomes ADP and phosphate' which is relevant to the context of the question but there is a limited discussion and different aspects of the process missing.
This is a Level 1 answer which was awarded 2 marks.

Q5 (e)

A four-mark question from section A5.2i of the unit content which required the names of four parts of the female reproductive system in birds.

(e) State the name of **four** parts of the female reproductive system in birds.

(4)

1 Ovary (only have 1 functioning ovary)
2 Infundibulum
3 Magnum
4 Cloaca

4 marks
Four accurate names stated to be awarded 4 marks.

A poor response:

(e) State the name of **four** parts of the female reproductive system in birds. (4)

1 Vagina
2 Cervix
3 Ovaries
4 Vulva

1 mark
The only rewardable mark in this response is for 'ovaries'- 1 mark awarded.

Q6 (a)
This question is from section A6.1 in the unit content and required the learner to explain two differences between the excretory systems of birds and mammals to be awarded four marks.

A good response:

6 Excretion allows waste products to be removed from the body.

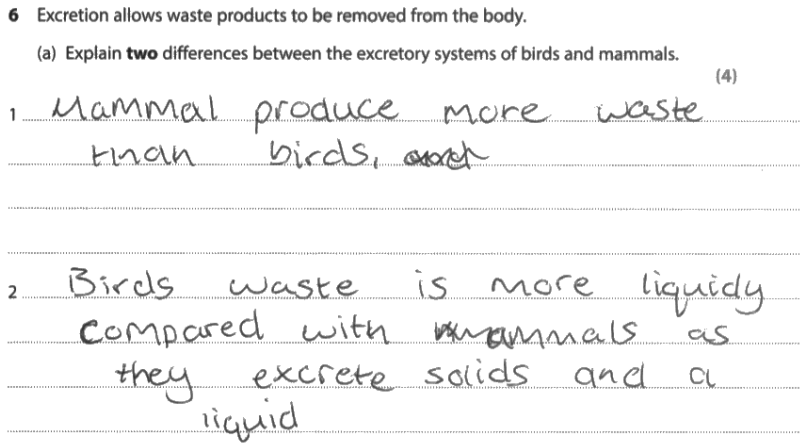
(a) Explain **two** differences between the excretory systems of birds and mammals. (4)

1 Mammals have a bladder to store urine whereas birds do not

2 Birds have a vent whereas mammals have a urethra

3 marks
This response demonstrates an understanding of both Mammals and Birds' excretory systems. The first difference has been identified and explained; however, the second difference includes two identifications with no expansion and could therefore only be awarded three marks.

A poor response:



6 Excretion allows waste products to be removed from the body.

(a) Explain **two** differences between the excretory systems of birds and mammals.

(4)

1 Mammal produce more waste than birds, ~~exce~~

2 Birds waste is more liquidy compared with ~~m~~mammals as they excrete solids and a liquid

0 marks

An incorrect answer – no rewardable marks.

Q6 (b)

This was a one-mark question from section A6.4 of the unit content requiring the learner to recognise 'nephritis' as inflammation of the kidney to be able to give a specific, rather than generic, symptom.

A good response:

(b) Give **one** symptom of nephritis.

(1)

exsessive urination

1 mark

As per the first marking point in the mark scheme -1 mark.

A poor response:

(b) Give **one** symptom of nephritis.

(1)

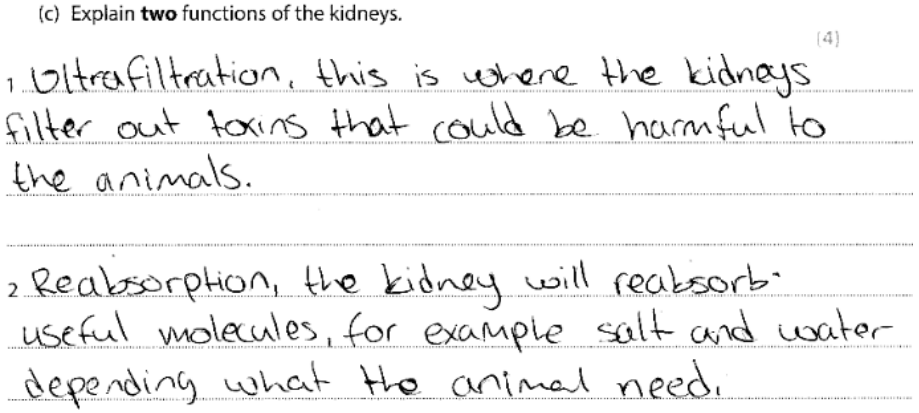
Constipation

0 mark

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

Q6 (c)

This four-mark question from section A6.1 in the unit content required the learner to identify two functions of the kidney and explain each one for four marks.


(c) Explain **two** functions of the kidneys.

(4)

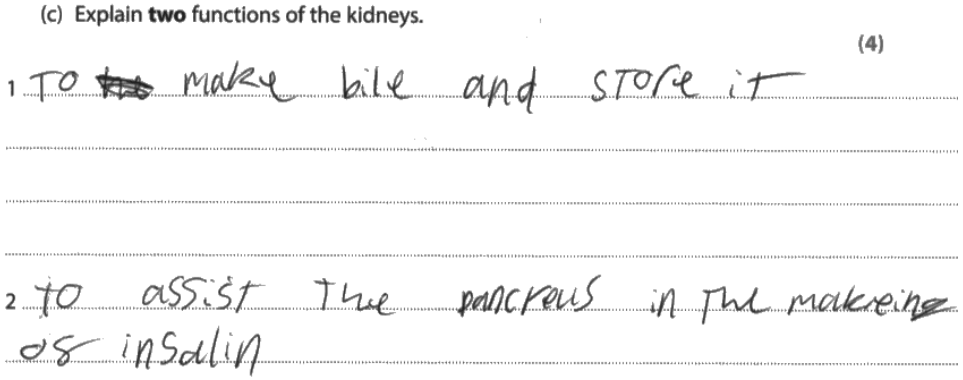
1 Ultrafiltration, this is where the kidneys filter out toxins that could be harmful to the animals.

2 Reabsorption, the kidney will reabsorb useful molecules, for example salt and water depending what the animal need.

4 marks

A complete accurate response as per marking points two and three in the mark scheme to achieve the full four marks.

A poor response:


(c) Explain **two** functions of the kidneys.

(4)

1 To ~~the~~ make bile and store it

2 to assist the pancreas in the makeing of insulin

0 marks

Two incorrect functions identified and explained– no rewardable marks.

Q6 (d)

A two-mark question from section A6.2 in the unit content to state the name of two parts pf a nephron.

A good response:

(d) State the name of **two** parts of a nephron. (2)

1 Loop of Henle
2 Bowmans Capsule

2 marks

Two correct parts named – 2 marks awarded

A poor response:

(d) State the name of **two** parts of a nephron. (2)

1 axon
2 dendrite

0 marks

This response has confused 'nephron' with 'neuron' and many similar responses were seen– no rewardable marks.

Q7

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 process of osmoregulation. It is from section A6.2 of the Unit Content and required an understanding of the action of antidiuretic hormone in the process.

A good response:

It is important for a constant osmotic pressure to be maintained in an animal's body.

7 Discuss the process of osmoregulation. (8)

Osmoregulation is a homeostatic process that aims to keep the water balance at a normal level within the body. Osmoreceptors detect the level of water present in the blood. If the osmoreceptors detect there is too much water in the blood, less anti-diuretic hormone (ADH) is released from the pituitary gland. This causes the kidneys (in particular nephron) to reabsorb less water. This creates more volume of dilute urine to be removed from the body. This then lowers the water

content in the blood back to normal. If the osmoreceptors detect there is too little water in the blood (dehydration), more ADH is released from the pituitary gland. This causes the kidneys to reabsorb more water (in distal convoluted tubule loop of Henle). This ~~cause~~ creates a lower volume of concentrated urine to be removed from the body, preventing too much water being lost. This then increases the water content in the blood back to normal.
The secretion of ADH dictates how much or little water should be reabsorbed into the body. This process happens continually to keep a balance of water in the body. When the water is being reabsorbed in the ~~loop~~ kidney it transported by osmosis. Osmosis is the movement of water molecules from a low solute concentration to a high solute concentration. It passes through a semi-permeable membrane and continues until equilibrium is met (isotonic).

8 marks

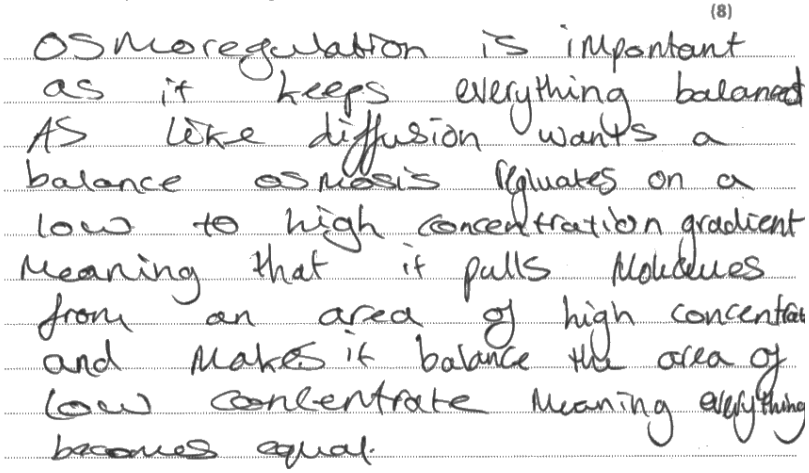
This response demonstrates accurate, detailed knowledge and understanding of the process of osmoregulation. The discussion has been logically approached and is well developed with a range of different aspects considered and clear links as to how they all interrelate relevant to the context of the question.
This is a Level 3 answer which was credited with 8 marks.

A poor response:

It is important for a constant osmotic pressure to be maintained in an animal's body.

7 Discuss the process of osmoregulation.

(8)



0 marks

This response does not answer the question about 'osmoregulation', the learner has focused on the stem of the question regarding 'osmotic pressure' and discussed the process of osmosis.

Summary

- Be familiar with the function / role / location of organs and tissues and components of the body systems. Know the effect / symptom of named diseases on the body from the unit content.
- Be able to differentiate between the systems in birds and mammals.
- Know the fluid mosaic model of the plasma membrane and the sliding filament theory of muscle contraction.
- Know the gestation periods of different mammals.
- Know that endothermic applies to warm blooded animals and ectothermic to cold blooded animals before explaining about maintaining body temperature.
- Differentiate between nephron and neuron.
- Be able to identify all cell organelles.
- Know names of hormones and their functions notably ADH in osmoregulation.
- Read the question to ensure the answer given reflects what has been asked i.e. explain two requires two identifications with associated expansions.
- Be familiar with all body systems and understand adaptations i.e. countercuurrent mechanism to control body temperature and brown adipose tissue.
- Specification and/or sample assessment materials (SAMs) located on the BTEC National qualification webpage located here.

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