Examiners' Report/
Lead Examiner Feedback

January 2018

BTEC Level 3 National in Animal Management

Unit 2: Animal Biology (31645H)

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Grade Boundaries

What is a grade boundary?

A grade boundary is where we set the level of achievement required to obtain a certain grade for the externally assessed unit. We set grade boundaries for each grade, at Distinction, Merit, Pass and Near Pass.

Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the external assessment. When we can see the full picture of performance, our experts are then able to decide where best to place the grade boundaries – this means that they decide what the lowest possible mark is for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. Given grade boundaries is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in external assessments

Each external assessment we set asks different questions and may assess different parts of the unit content outlined in the specification. It would be unfair to learners if we set the same grade boundaries for each assessment, because then it would not take accessibility into account.

Grade boundaries for this, and all other papers, are on the website via this link:
http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

Animal Biology: Unit 2 31645H

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	0	9	19	34	50

Introduction

January 2018 was the second 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 was 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 1

The majority of learners scored 0 marks for question 1a) through incorrect terminology used either from inaccurate reading of the question or a failure to recall basic facts precisely.

Q1(a)

0 marks awarded

1 (a) The animal skeleton is divided into two main divisions.

Complete the table with the **two** divisions of the skeletal system.

(2)

Divisions of skeleton	Components
Musculoskeletal	Shoulder, pelvis, upper limbs, lower limbs
	Skull, vertebral column, ribs and sternum.

The learner has not been able to recall the information about the skeletal system to complete the table accurately with the correct divisions.

2 marks awarded

1 (a) The animal skeleton is divided into two main divisions.

Complete the table with the **two** divisions of the skeletal system.

(2)

Divisions of skeleton	Components
Apendicular	Shoulder, pelvis, upper limbs, lower limbs
Axial	Skull, vertebral column, ribs and sternum.

The learner has identified the two correct divisions of the skeletal system.

Q1(b)

This question was answered well with the majority of learners scoring 1 mark.

0 marks awarded

(b) State **one** adaptation of a rabbit's skeleton that helps the rabbit to hop.

(1)

Strong muscle on the legs

The learner has not stated an adaptation of the skeleton to demonstrate an understanding of the question.

1 mark awarded

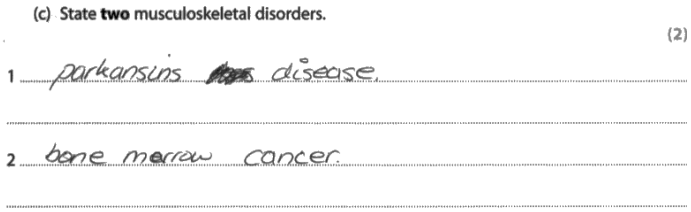
(b) State **one** adaptation of a rabbit's skeleton that helps the rabbit to hop.

They are plantigrade

The learner has correctly stated the term plantigrade and was awarded 1 mark.

Q1(c)

0 marks awarded


(c) State **two** musculoskeletal disorders.

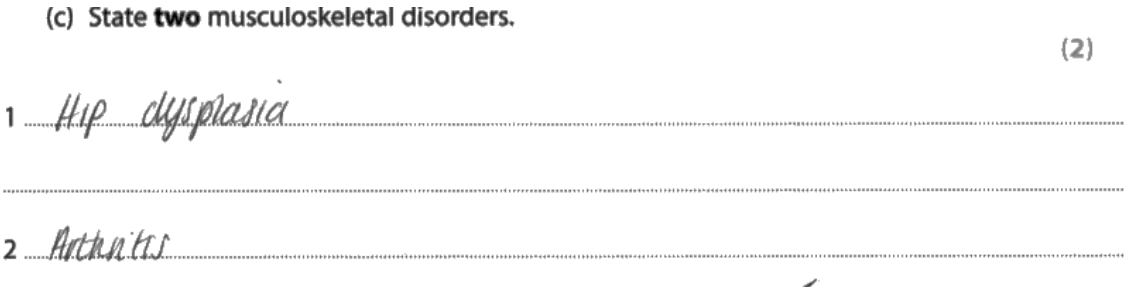
(2)

1 parkansins disease.

2 bone marrow cancer.

The learner has not understood the question and used human examples and therefore scored 0 marks.

2 marks awarded


(c) State **two** musculoskeletal disorders.

(2)

1 Hip dysplasia

2 Arthritis

The learner has correctly identified two musculoskeletal disorders. Learners were credited with incorrect spelling of identifiable, appropriate disorders.

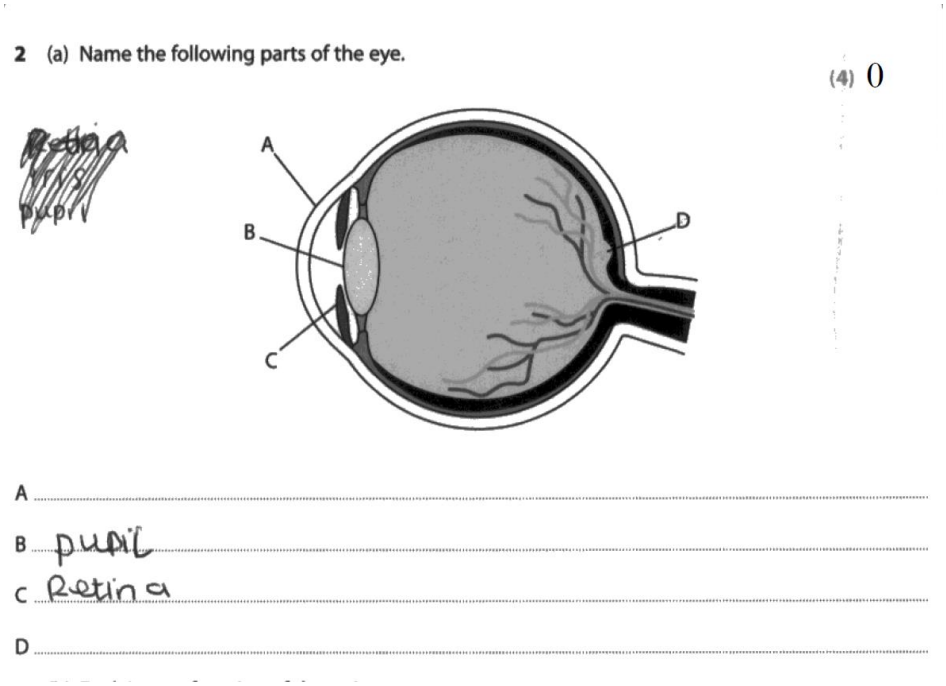
Question 2

Question 2 parts a), b), c) and d) were all related to the eye and required a demonstration of understanding as well as memory recall.

Q2(a)

The majority of learners scored 0 / 1 mark for this question through being unable to recall the parts of the eye.

0 marks awarded

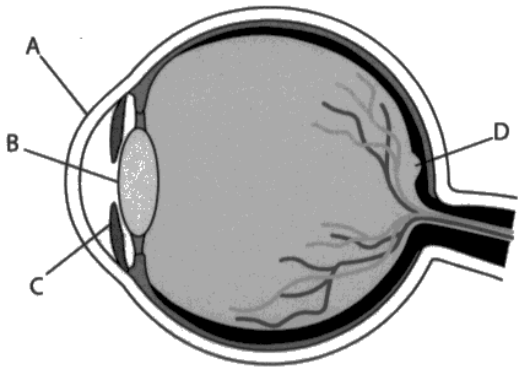


The learner has been unable to recall the correct parts of the eye as labelled in the diagram.

2 marks awarded

2 (a) Name the following parts of the eye.

(4)



A .....

B Lense .....

C iris .....

D retina .....

The learner has correctly named two of the four parts of the eye.

Q2(b)

The majority of learners scored 0 for this question through being unable to demonstrate undertanding of the function of the retina.

0 marks awarded

(b) Explain **one** function of the retina.

(2)

reflects image back ~~onto~~ towards the lens, ~~to focus~~ so the lens can focus and flip the image.

Although the learner has attempted the question it is evident that they have not understood the function of the retina and therefore gained 0 marks.

2 marks awarded

(b) Explain **one** function of the retina.

(2)

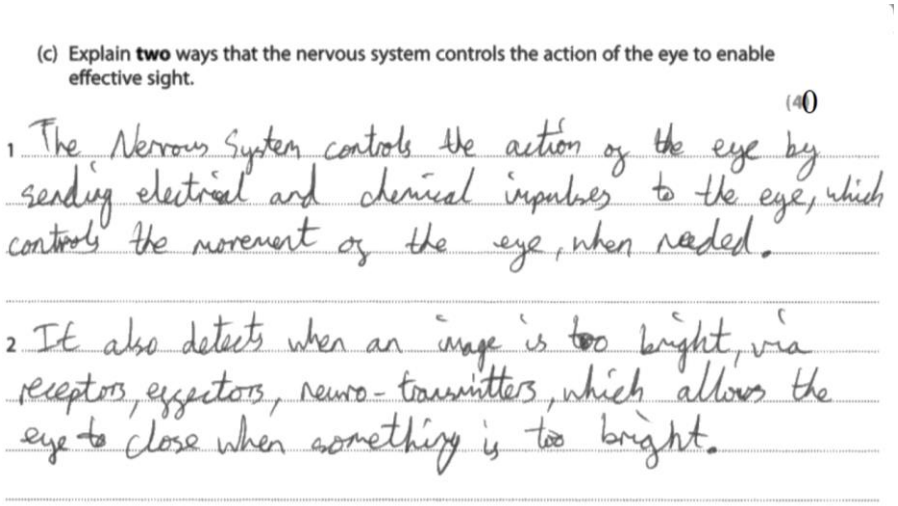
The retina is where all of the rod and cone cells are, They pick up light and colour and send the impulses to the optic nerve, which then goes to the brain.

The learner has provided a good complete answer demonstrating an understanding of the function of the retina.

Q2(c)

The majority of learners scored 0 / 1 / 2 marks for this question demonstrating partial understanding / ability to explain the way the nervous system controls the action of the eye.

0 marks awarded



(c) Explain **two** ways that the nervous system controls the action of the eye to enable effective sight.

(4) 0

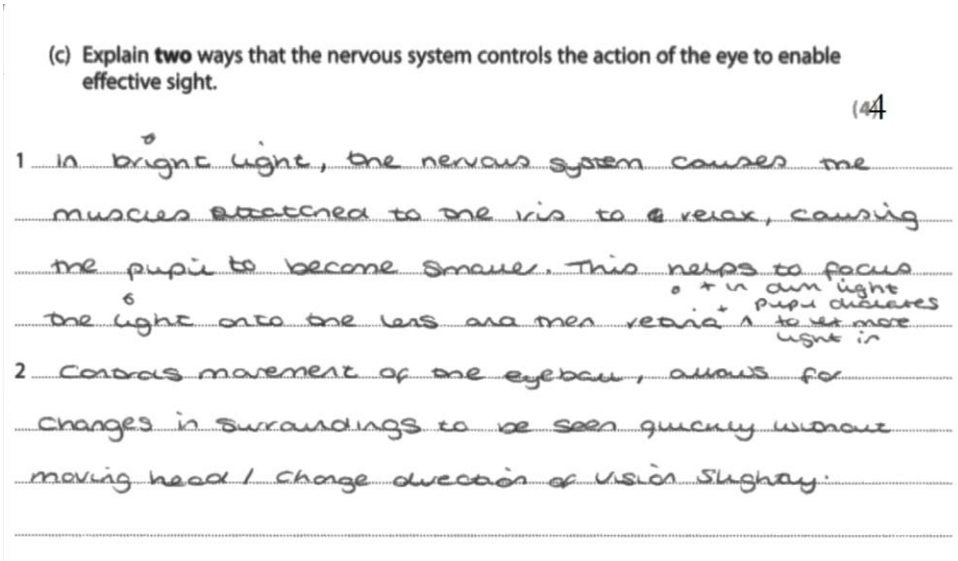
1 The Nervous System controls the action of the eye by sending electrical and chemical impulses to the eye, which controls the movement of the eye, when needed.

2 It also detects when an image is too bright, via receptors, effectors, neuro-transmitters, which allows the eye to close when something is too bright.

The learner has not understood the question re 'control the action of the eye'

This question was frequently answered by learners identifying 'rods and cones' which relate to the previous question 2b). This indicated that facts were known about the eye but not completely understood.

4 marks awarded



(c) Explain **two** ways that the nervous system controls the action of the eye to enable effective sight.

(4) 4

1 In bright light, the nervous system causes the muscles attached to the iris to relax, causing the pupil to become smaller. This helps to focus the light onto the lens and then retina. + in dim light pupil dilates to let more light in

2 Controls movement of the eyeball, allows for changes in surroundings to be seen quickly without moving head / change direction of vision slightly.

The learner has accurately explained two ways that the nervous system controls the action of the eye for effective sight to gain 4 marks.

Q2(d)

This question was well answered with the majority of learners scoring 3 marks.

0 marks awarded

(d) Explain **one** advantage of eye positioning in sheep.

(3)

The advantage of eye position in sheep, is that the eyes is deeper into its skull, this allows more protection from predators, as its harder to get to.

The learner has been unable to explain the advantage accurately to gain any marks for this question.

4 marks awarded

(d) Explain **one** advantage of eye positioning in sheep.

(3)

sheep have binocular vision as the eyes are on the side of their heads, this allows them to see far round behind them. This helps sheep spot oncoming predators.

The learner has provided a good complete answer to achieve 3 marks.

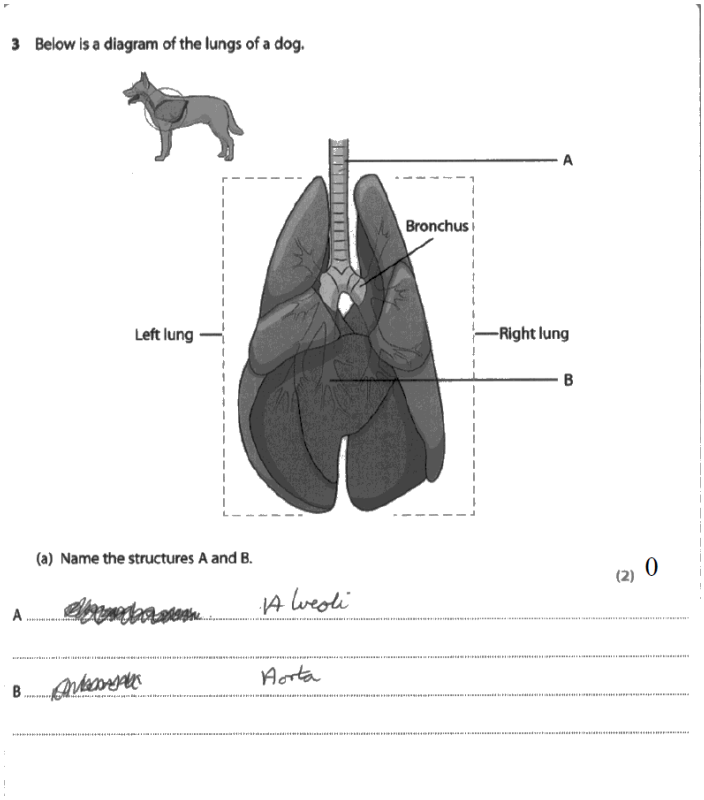
Question 3

Questions 3a), 3b) and 3c) relate to the respiratory system and the majority of learners were unable to demonstrate an accurate understanding of either the role of the diaphragm or the control of respiratory rate and volume and scored 0 marks for these questions.

Q3(a)

The majority of learners correctly named either one or both of the structures in the lungs and there were many who incorrectly identified the trachea as the oesophagus.

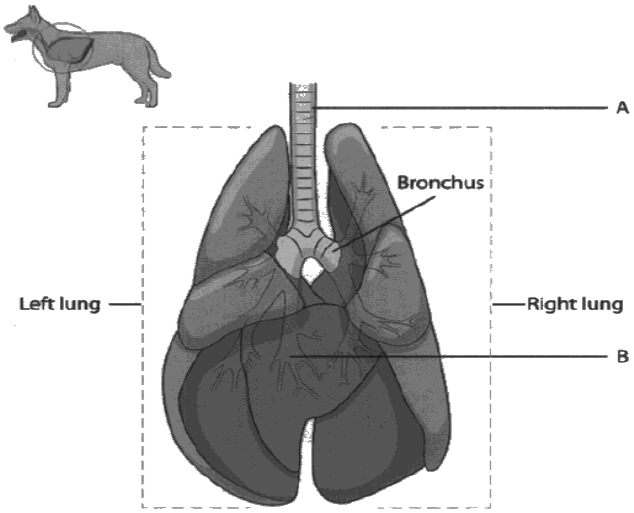
0 marks awarded



The learner has been unable to recall the correct names of the structures.

2 marks awarded

3 Below is a diagram of the lungs of a dog.



(a) Name the structures A and B.

(2) 2

A Trachea

B Bronchioles

The learner has correctly named the structures in the lungs. Learners were awarded a mark for incorrect, identifiable spellings of the structures.

Q3(b)

0 marks awarded

(b) Describe the role of the diaphragm.

(4)

Your diaphragm is there to protect all of your vital organs and to keep them from moving about so the body isn't affected

The learner has been unable to demonstrate an understanding through describing the role of the diaphragm.

4 marks awarded

(b) Describe the role of the diaphragm.

(4) 4

When air is ~~into~~ inhaled, the intercostal muscles contract, causing the diaphragm to contract and flatten. this increases the volume of the chest cavity, allowing more air to enter the lungs. ~~When Due to increased pressure in the lungs,~~ when the intercostal muscles relax and the diaphragm relaxes, making a ball shape, it reduces ~~ing~~ es lung capacity and increases ~~ing~~ es pressure to expel air by exhalation.

The learner has demonstrated a sound understanding of the role of the diaphragm.

Q3(c)

The majority of learners scored 0 marks for this question through having no understanding of the concept of the control mechanisms for respiratory rate or volume. Many incorrectly focused on heart rate as the control mechanism.

0 marks awarded

When dogs exercise, their respiratory rate and volume increases.

(c) Describe how respiratory rate and volume are controlled.

(4)

They are controlled by the lungs. they push the air in and out the lungs ~~fast~~

The learner has not described an understanding of the way in which receptors in the lung walls control tidal volume.

3 marks awarded

When dogs exercise, their respiratory rate and volume increases.

(c) Describe how respiratory rate and volume are controlled.

(4)

One way is the bohr effect where the body has to make up for high rates of carbon dioxide which produces carbonic acid so ~~so~~ haemoglobin comes to deliver more oxygen. Another way is through respiration; anaerobic and aerobic. If the dog wants a burst of energy it uses ~~aerob~~ anaerobic if the dog is going for a long time it's ~~with~~ aerobic respiration.

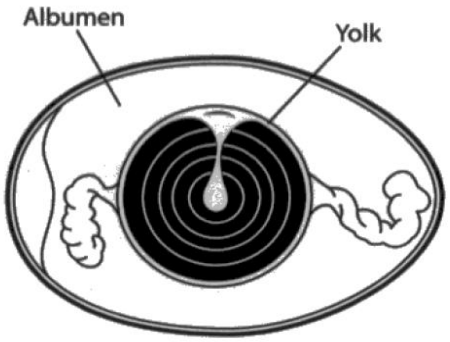
The learner has described an understanding of the principle of the Bohr Effect and anaerobic respiration to be awarded 3 marks.

Question 4

Q4(a)
The majority of learners scored one / two marks for this question through identifying a role without an explanation.

0 marks awarded

4 Below is an image of a cross section of a chicken egg.



(a) Explain the role of the **two** structures identified in the diagram.

(4) 0

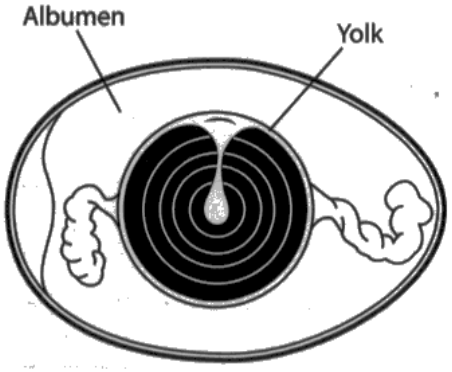
Yolk

The yolk acts like a nucleus and will contain embryo of the chicken, which is where all the DNA is stored.

The learner does not know the role of these two structures and has unsuccessfully attempted to explain one and scored 0 marks.

4 marks awarded

4 Below is an image of a cross section of a chicken egg.



(a) Explain the role of the **two** structures identified in the diagram.

(4)

Yolk

The yolk is the main area where the chick embryo will get its nutrients. This is needed for the chick can properly grow and develop.

Albumen

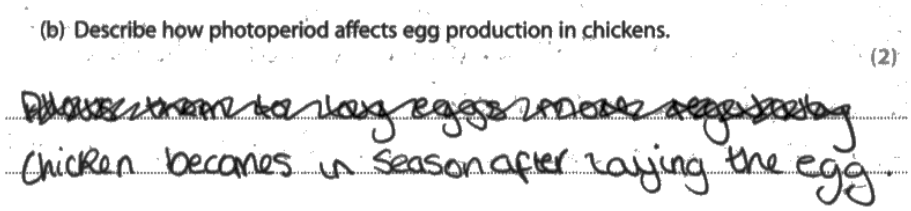
The Albumen is a Second area of nutrients but is also a protection block of bacteria. As this protects the chick from being infected in its environment.

The learner has fully identified and explained the role of both the Yolk and the Albumen.

Q4(b)

The majority pf learners scored 0 marks for this question either through not understanding what photoperiod is or confusing increasing and decreasing egg production related to appropriate light conditions.

0 marks awarded

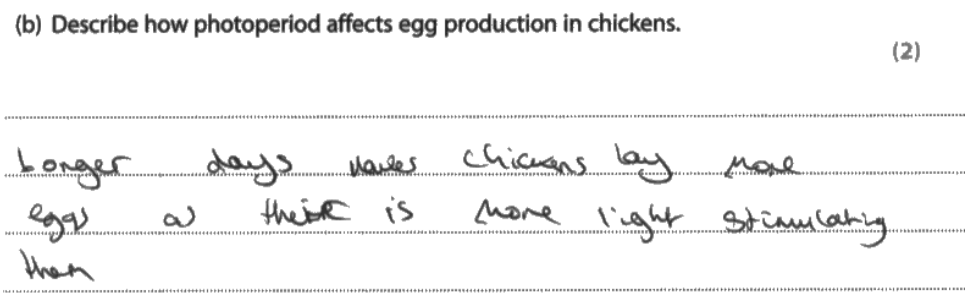

(b) Describe how photoperiod affects egg production in chickens.

(2)

chicken becomes in season after laying the egg.

The learner clearly does understand the term photoperiod and has scored 0 marks.

2 marks awarded


(b) Describe how photoperiod affects egg production in chickens.

(2)

longer days makes chickens lay more eggs as there is more light stimulating them

The learner has provided a succinct description of how the concept of photoperiod affects egg production to score 2 marks.

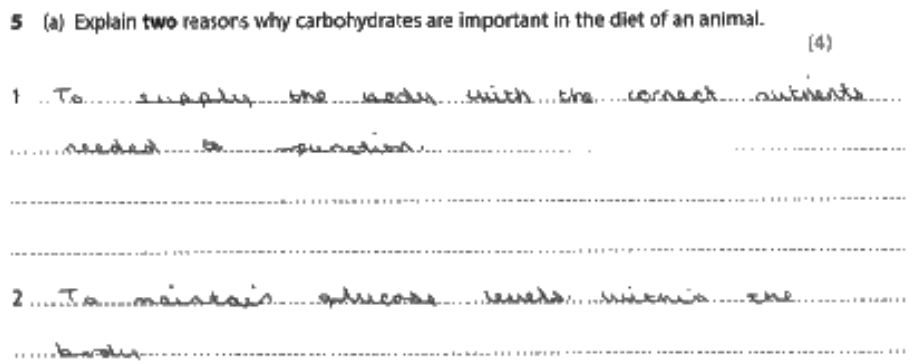
Question 5

Questions 5a), 5b) and 5c) related to the digestive system and the majority of learners scored 0 / 1 mark for each through a lack of understanding of the topics. Carbohydrates were confused with proteins and fats when explaining their importance in the diet.

Q5(a)

Many learners who scored 1 mark identified carbohydrates provide energy as the only reason but were unable to explain why.

0 marks awarded



5 (a) Explain **two** reasons why carbohydrates are important in the diet of an animal.

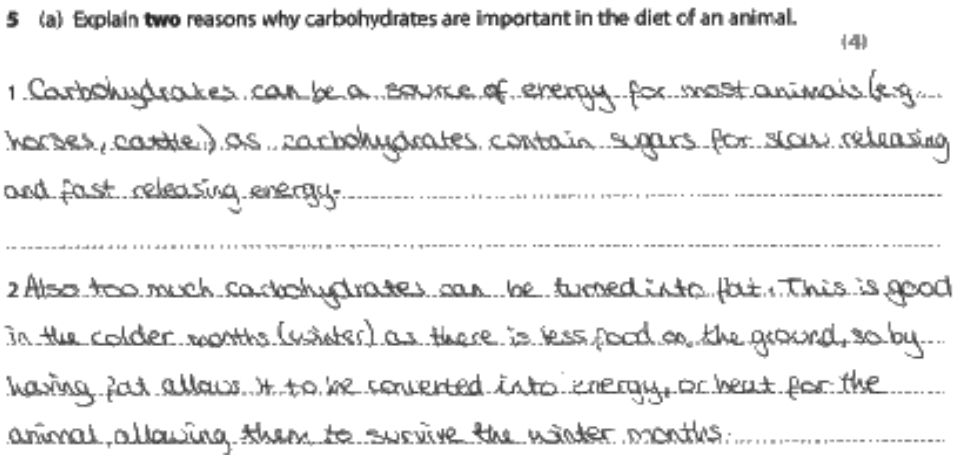
(4)

1 To supply the body with the correct nutrients needed for respiration.

2 To maintain glucose levels within the body.

The learner has an understanding of the concept but has inadequately explained the importance of carbohydrates specifically.

4 marks awarded



5 (a) Explain **two** reasons why carbohydrates are important in the diet of an animal.

(4)

1 Carbohydrates can be a source of energy for most animals (e.g. horses, cattle) as carbohydrates contain sugars for slow releasing and fast releasing energy.

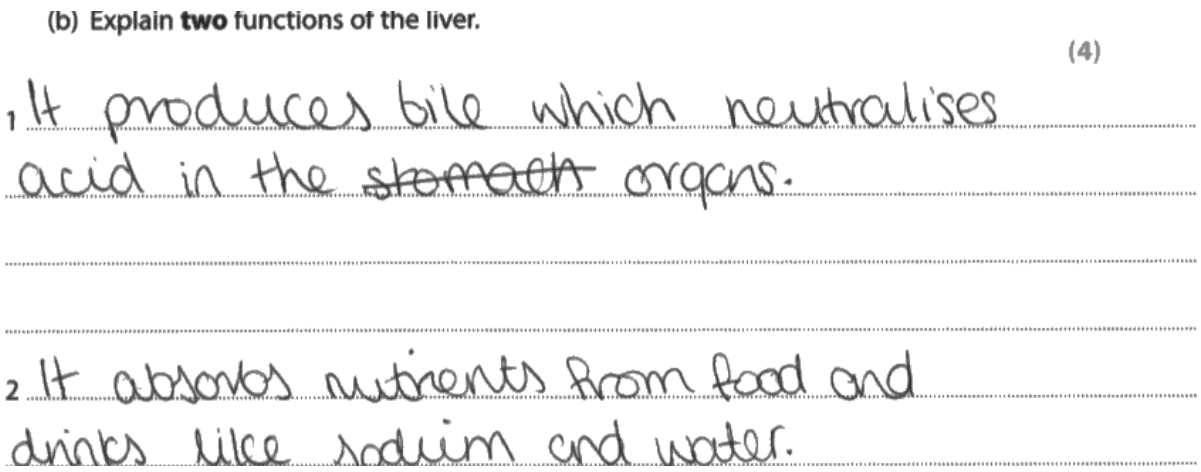
2 Also too much carbohydrates can be turned into fat. This is good in the colder months (winter) as there is less food on the ground, so by having fat allows it to be converted into energy, or heat for the animal, allowing them to survive the winter months.

The learner has comprehensively explained two reasons why carbohydrates are important in the diet of an animal to score 4 marks.

Q5(b)

The learners who scored 1 mark for this question were able to identify that the production of bile is one function of the liver but they were unable to explain it.

1 mark awarded



(b) Explain **two** functions of the liver.

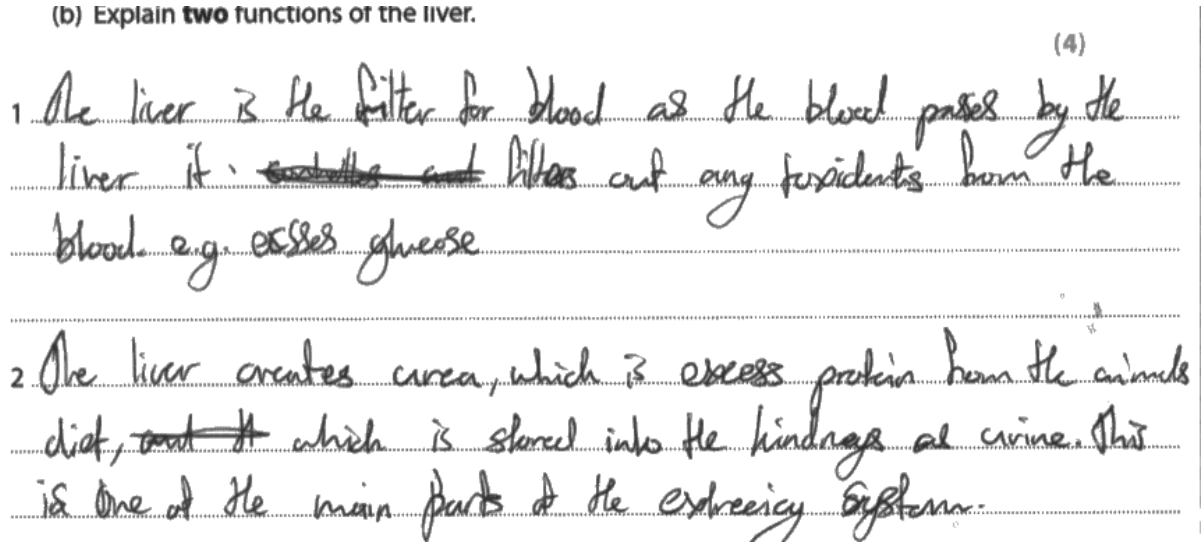
(4)

1 It produces bile which neutralises acid in the ~~stomach~~ organs.

2 It absorbs nutrients from food and drinks like sodium and water.

The learner has identified bile production as one function of the liver but inaccurately explained it and the second function is incorrect. A total of 1 mark was awarded.

3 marks awarded



(b) Explain **two** functions of the liver.

(4)

1 The liver is the filter for blood as the blood passes by the liver it ~~~~ filters out any toxicants from the blood. e.g. excess glucose

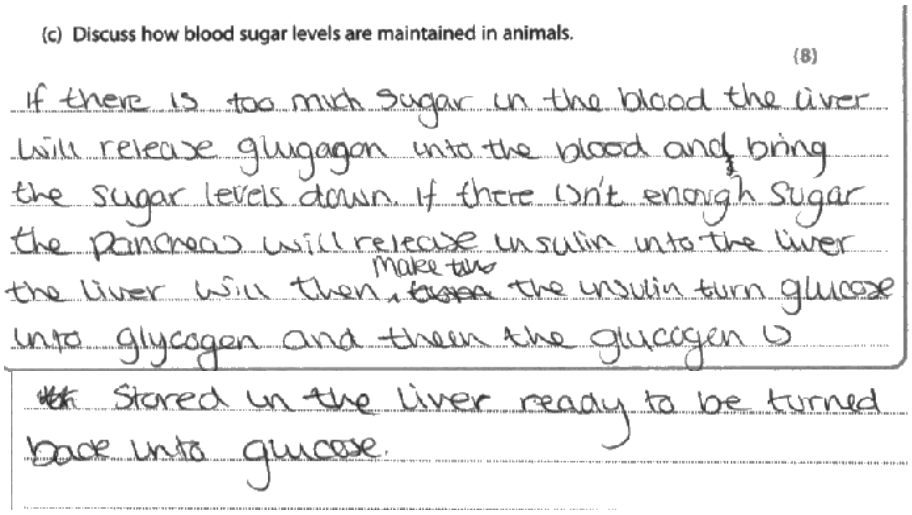
2 The liver creates urea, which is excess protein from the animals diet, ~~out it~~ which is stored into the kidneys as urine. This is one of the main parts of the excreacy system.

The learner has correctly identified two functions of the liver, fully explained one but not the other and so was awarded 3 marks.

Q5(c)

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. The majority of responses scored 0 or were at level 1 for this question with most confusion around the terms 'glucose', 'glycogen', 'glucagon' and whether blood sugar levels were being 'increased' or 'decreased' by the effects of insulin / glucagon.

1 mark awarded



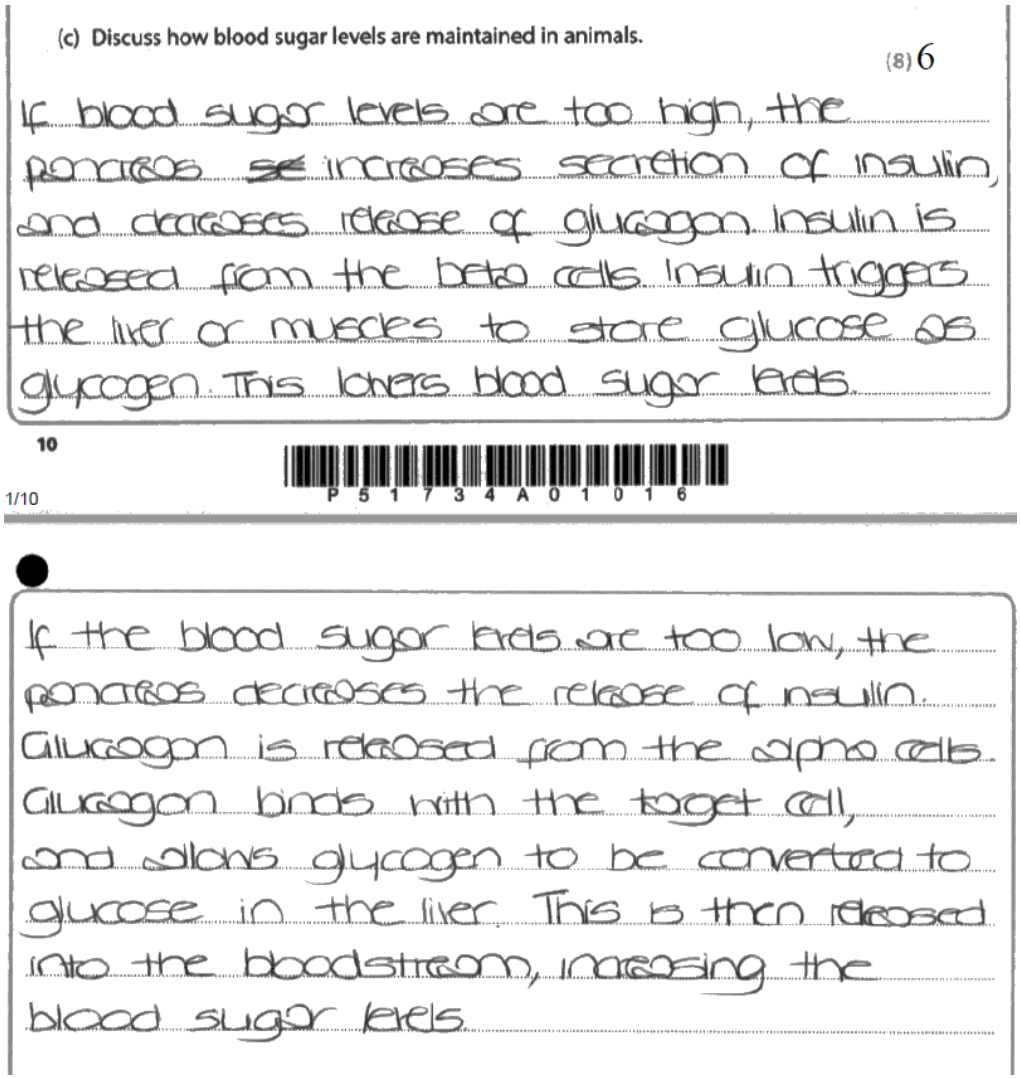
(c) Discuss how blood sugar levels are maintained in animals.

(8)

If there is too much sugar in the blood the liver will release glugagon into the blood and bring the sugar levels down. If there isn't enough sugar the pancreas will release insulin into the liver the liver will then, make the insulin turn glucose into glycogen and theen the glucogen is stored in the liver ready to be turned back into glucose.

The learner has confused the role of insulin and glucagon but has been credited for having rewardable material related to 'insulin turn glucose into glycogen and glycogen being stored in the liver ready to be turned back into glucose'. This response demonstrates isolated knowledge and understanding of the concept of how blood glucose levels are maintained in animals.

6 marks awarded



(c) Discuss how blood sugar levels are maintained in animals.

(8) 6

If blood sugar levels are too high, the pancreas ~~se~~ increases secretion of insulin, and decreases release of glucagon. Insulin is released from the beta cells. Insulin triggers the liver or muscles to store glucose as glycogen. This lowers blood sugar levels.

10

1/10

P 5 1 7 3 4 A 0 1 0 1 6

If the blood sugar levels are too low, the pancreas decreases the release of insulin. Glucagon is released from the alpha cells. Glucagon binds with the target cell, and allows glycogen to be converted to glucose in the liver. This is then released into the bloodstream, increasing the blood sugar levels.

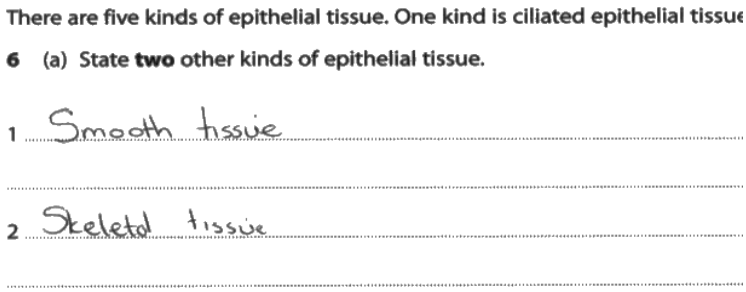
The learner has demonstrated accurate and thorough knowledge and understanding of how blood glucose levels are maintained in animals with limited linkage between elements to be awarded 6 marks i.e. a lower level 3. More comprehensive linkages and reasoning would be needed to achieve a higher mark in this grade boundary i.e. discussion of the negative feedback loop.

Question 6

Q6(a)

This is a memory recall question on animal tissue types with only 4 possible answers and the majority of learners scored 0 through incorrect terminology used either from inaccurate reading of the question or a failure to recall basic facts precisely.

0 marks awarded



There are five kinds of epithelial tissue. One kind is ciliated epithelial tissue

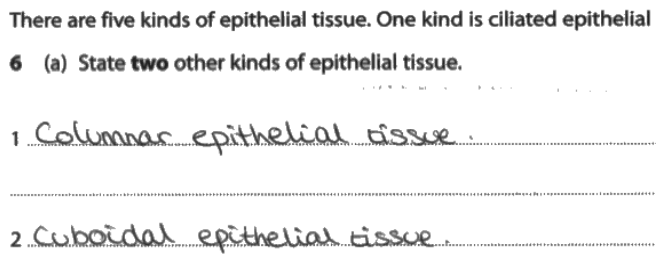
6 (a) State **two** other kinds of epithelial tissue.

1 Smooth tissue

2 Skeletal tissue

The learner has not identified any of the other four kinds of epithelial tissue and has scored 0 marks.

2 marks awarded



There are five kinds of epithelial tissue. One kind is ciliated epithelial

6 (a) State **two** other kinds of epithelial tissue.

1 Columnar epithelial tissue.

2 Cuboidal epithelial tissue.

The learner has correctly identified two of the four other kinds of epithelial tissue to score 2 marks.

Q6(b)

The majority of learners confused cilia with villi and scored 0 marks for this question.

0 marks awarded

(b) Explain **two** roles of ciliated epithelial tissue.

1 To allow for things to pass through the tissue diffusion to occur.

2 To allow for nutrients to be absorbed.

The learner has confused cilia with villi and scored 0 marks.

4 marks awarded

(b) Explain **two** roles of ciliated epithelial tissue.

(4)

1 to remove any harmful substances in the air-(trachea) hairs to stop it from reaching the lungs. like dust, pathogens and other harmful particles

2 To help move the eggs in the fallopian tubes from the ovary to the uterus as it creates a current.

The learner has correctly identified two roles of ciliated epithelial tissue and explained each one to achieve 4 marks.

Q6(c)

The few learners who understood this theory explained it well but the majority of learners did not understand it / had not learnt it / been taught it and scored 0 marks.

0 marks awarded

(c) Describe the sliding filament theory of muscle contraction. SOP1

(4)

As sodium enters the inside of the ~~cell~~ axon becomes more ~~x~~positive than the outside. Then as sodium leaves, potassium entres the axon. This makes the outside more positive than the inside. This is known as the sodium potassium pump. They have phospholipid heads (loves water) and ~~phosph~~ phospophobic tails so

The learner has not described the sliding filament theory of muscle contraction and has scored 0 marks.

4 marks awarded

Thick myosin filament heads bind to achive sites on the thin achin filaments. The myosin head then moves pulling on the achin filament with it. This is during contraction. Ca^{2+} is needed to bind with ~~tropomyosin~~ troponin to create ~~complex~~ calcitropomin which reveals the achn binding site for the myosin head. After one powerstroke the head unbind from the site onto another to power stroke that.

4 marks awarded

(c) Describe the sliding filament theory of muscle contraction.

(4)

In sliding filament theory muscles shorten as they contract as thick and thin filaments slide over each other and overlap.

Both of the above leaners have described the sliding filament theory of muscle contraction, one extensively and the other succinctly and each learner was awarded 4 marks.

Q6(d)

This question was answered well by learners who understood the concept with good examples provided, while the majority who did not understand either did not attempt to answer, confused fast and slow or guessed incorrectly re human reactions.

0 marks awarded

(d) Compare fast and slow twitch muscle fibres.

(4)

Fast twich muscle fibres are represented as a reflex. ~~because the stimulus causes the~~ For example, when someone touches a hot surface their hand immediately is taken off it. This is because the fast twitch muscle fibre is involuntary and allows a faster reaction, whereas a slow twitch muscle fibre would give a slow reaction.

(Total for Question 6 = 14 marks)

The learner has not understood the concept of fast and slow twitch muscle fibres and guessed using human example resulting in 0 marks awarded.

4 marks awarded

Fast and Slow twitch muscle fibres both bring about movement and need ATP but they differ in resistance and respitory methods. Slow twitch muscle fibres work aerobically (with Oxygen) they need moderate ~~ATP~~ and are very resistant to fatigue. Fast twitch muscle fibres work anaerobically (without O2) they work faster but are less resistant to fatigue, tiring easily.

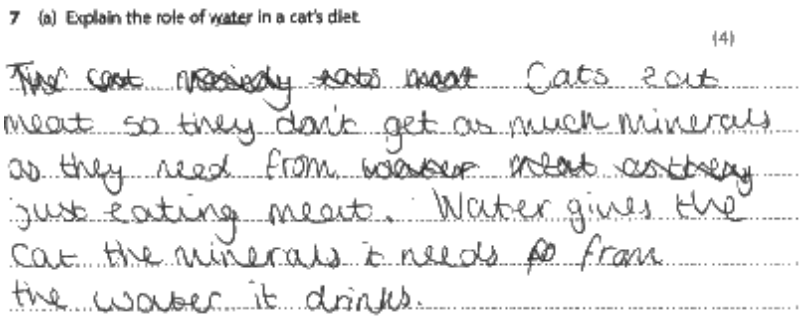
The learner has fully compared fast and slow twitch muscle fibres to score 4 marks.

Question 7

Q7(a)

This question about the role of water in a cat's diet allowed the majority of learners to identify 'prevents hydration' for 1 mark but they were unable to explain why.

0 marks awarded



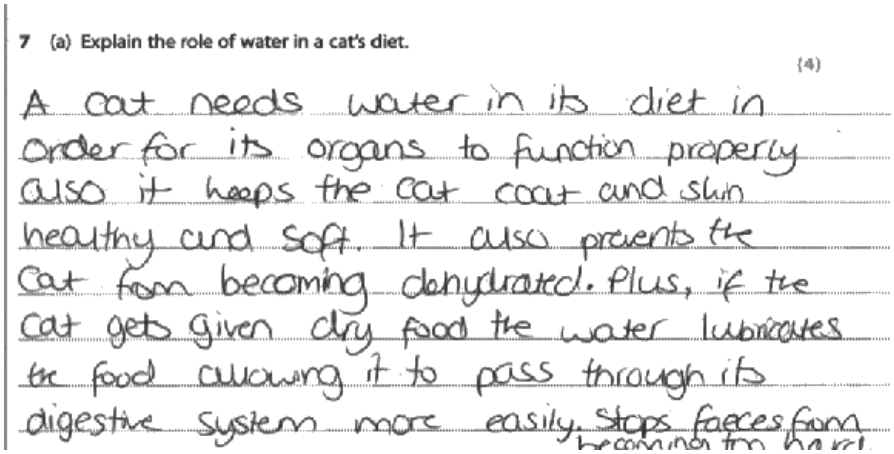
7 (a) Explain the role of water in a cat's diet.

(4)

The cat mostly eats meat. Cats eat meat so they don't get as much minerals as they need from however meat as they just eating meat. Water gives the cat the minerals it needs to from the water it drinks.

The learner has provided a very confused response and not explained the role of water in a cat's diet so has scored 0 marks.

4 marks awarded



7 (a) Explain the role of water in a cat's diet.

(4)

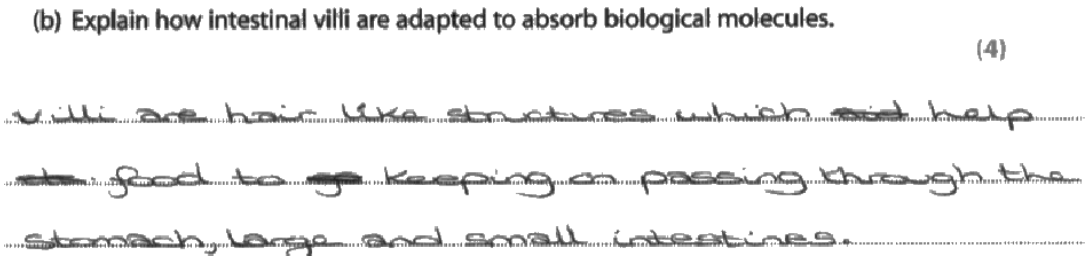
A cat needs water in its diet in order for its organs to function properly also it keeps the cat coat and skin healthy and soft. It also prevents the cat from becoming dehydrated. Plus, if the cat gets given dry food the water lubricates the food allowing it to pass through its digestive system more easily. Stops faeces from becoming too hard.

The learner has provided a good, complete explanation of the role of water in a cat's diet including dehydration, organs functioning properly, lubricated food to pass through digestive system, aids faecal elimination, all sufficient to be awarded 4 marks.

Q7(b)

Responses to this question included confusion with cilia and learners restating from the question that villi absorb biological molecules when they had to explain that they allowed more biological molecules to be absorbed over an increased surface area.

0 marks awarded

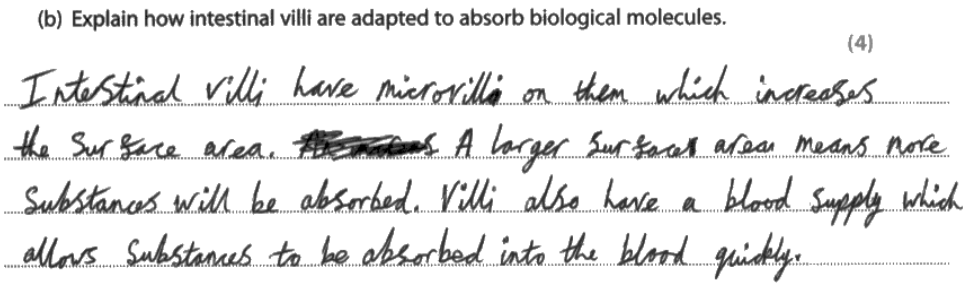

(b) Explain how intestinal villi are adapted to absorb biological molecules.

(4)

villi are hair like structures which ~~aid~~ help ~~to~~ food to ~~go~~ keeping on passing through the stomach, large and small intestines.

The learner has not answered the question and has scored 0 marks.

4 marks awarded


(b) Explain how intestinal villi are adapted to absorb biological molecules.

(4)

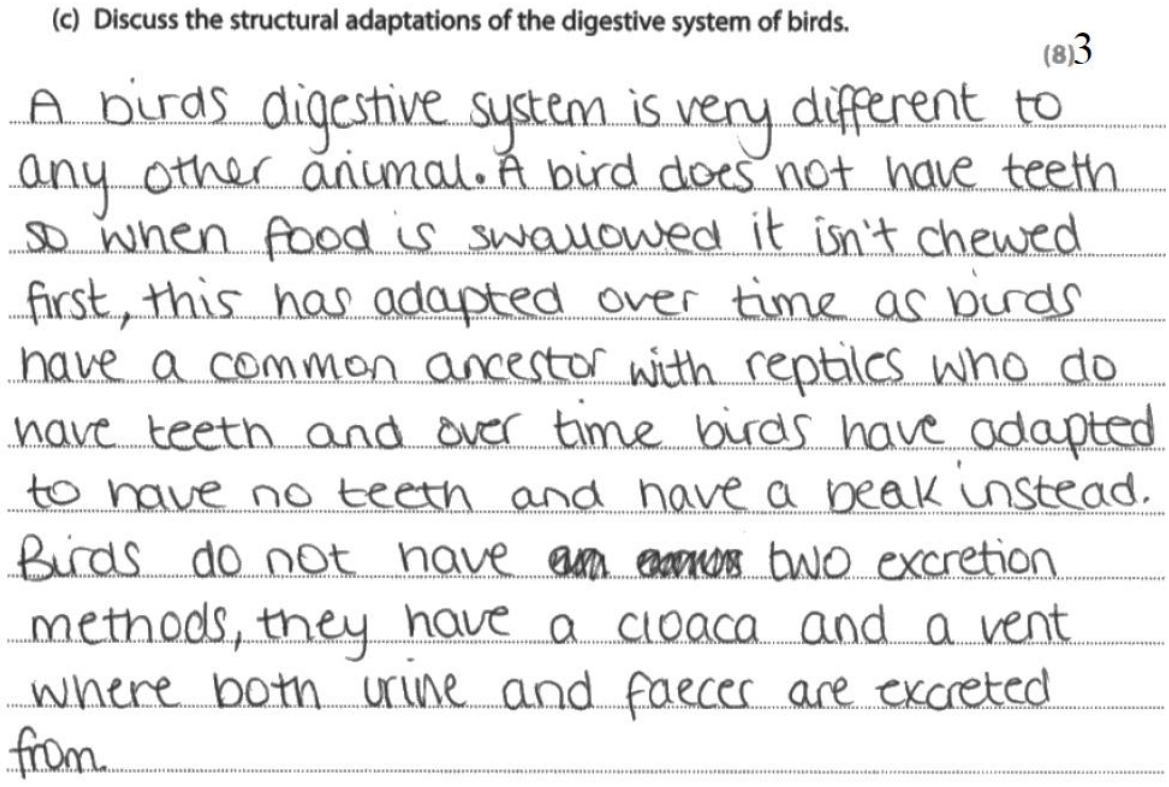
Intestinal villi have microvilli on them which increases the surface area. ~~The~~ A larger surface area means more substances will be absorbed. Villi also have a blood supply which allows substances to be absorbed into the blood quickly.

The learner has answered the question by fully identifying that villi increase the surface area and explained that this will allow more substances to be absorbed. Plus villi have a good blood supply for ease of absorption into the blood.

Q7(c)

This is the second competency based question and the last question on the paper which has 8 available marks awardable for the overall accuracy, thorough knowledge and understanding plus lines of reasoning evidenced in the learner response.
The majority of learners did not know the digestive system of a bird / could only recall one or two parts / they wrote about what they knew about birds having a light skeleton for flying and regurgitating food to feed their young, all of which resulted in either O marks from no rewardable material being evident or 1 mark from isolated elements of knowledge.

3 marks awarded



(c) Discuss the structural adaptations of the digestive system of birds.

(8) 3

A birds digestive system is very different to any other animal. A bird does not have teeth so when food is swallowed it isn't chewed first, this has adapted over time as birds have a common ancestor with reptiles who do have teeth and over time birds have adapted to have no teeth and have a beak instead. Birds do not have ~~an eagle~~ two excretion methods, they have a cloaca and a vent where both urine and faeces are excreted from.

The learner has evidenced isolated elements of knowledge and understanding through identifying that birds don't have teeth and they have a cloaca to remove urine and waste products which is a level 1 response scoring 3 marks.

5 marks awarded

(c) Discuss the structural adaptations of the digestive system of birds.

(8)

The Birds beak (depending on its diet) is suited best for what it is required to do to gain food, e.g. Bird that eats seeds, large blunt beak This beak is only needed for requiring the food after organs within deal with its breakage and absorbsion.

Next its the crop which is mostly used for storage as most birds migrate over long distances and will need sustinace on the journey

The Gizzard is then used as teeth to machanicly grind up food with teeth like keritin structures or swallowed up grit and ground.

The intestine system overall is a much smaller and less complicated version of a monogastric system. This smaller digestive system allows the bird to be more light. In all of the birds systems and even in its bones are required to enable flight so a much smaller and lighter digestive System is required.

The learner has demonstrated mostly accurate knowledge and understanding re the adaptations of beak, crop, gizzard and overall system with linkages between the beak and the gizzard and lines of reasoning through being adapted for flight. In order to achieved at Level 3 the learner should have followed through the digestive system past the gizzard discussing the proventriculus, then the two short caeca and lastly the elimination of waste through one exit, the cloaca.

Unit Summary

Based on the performance on this paper learners should:

- Be familiar with technical terms for parts of the skeleton, eye, respiratory system and epithelia tissue
- Avoid using human examples i.e. for musculoskeletal disorders and muscle twitch fibres
- Address the command word 'explain' by identifying the role / function and expand the answers to explain and gain up to the marks available (2 / 4 marks). Similarly with 'describe' and 'compare' questions where several points must be included according to the available marks per question (usually 4 marks)
- Be familiar with the content of the specifications as the questions are all based on the 'essential content' i.e. 'structural adaptations of the digestive system of birds' A2.6
- Develop a way to prevent confusion between 'decease and increase' re blood glucose, 'fast and slow' re muscle twitch fibres and 'contact and relax' re the diaphragm
- Learn the difference between essential nutrients to prevent confusing carbohydrates, proteins and fats