Examiners' Report
Lead Examiner Feedback

January 2022

Pearson BTEC National
In Sport and Exercise Science (31814H)
Unit 2: Functional Anathomy

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January 2022
Publications Code 31814H_2201_ER

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 and 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. Awarding 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://qualifications.pearson.com/en/support/support-topics/results-certification/grade-boundaries.html

Awarding BTEC qualifications in 2022

Ofqual has set out their plans for awarding qualifications in 2022 and intend to return to a normal, pre-pandemic, approach to grading standards over by 2023. They have confirmed that 2022 will be a transition year, to reflect that we are in a pandemic recovery period and students' education has been disrupted.

Our guiding principle and approach to awarding BTEC qualification results in 2022 will be to ensure parity in relation to the approach being taken for GCSE and A level learners. BTEC courses have a different structure and design to academic qualifications - BTECs are modular qualifications (with assessments taking place throughout the course) compared to GCSEs and A levels which are linear (assessed and awarded at the same time at the end of the year), and therefore our approach needs to be different.

In 2022 we will return to the usual method of calculating BTEC qualification results, however adaptations including, U-TAGs and reduced internal assessment, are in place to provide a comprehensive package of support for students.

The basis of our awarding approach to BTECs this year is to ensure it is as fair as possible for all learners. We will use a range of evidence to set grade boundaries for the external units. Part of this evidence will be to closely monitor learner performance in all assessments that contribute to learners' final qualification grade, to ensure parity with A level and GCSEs.

Further information can be found on our website and via our Social Media channels.

Unit 2: Functional Anathomy 31814H

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	**0**	**10**	**20**	**32**	**44**

Introduction

This is the first full series of external examinations since COVID restrictions. Centres and learners should be acknowledged for their preparation.

Overall, most learners were prepared and knowledgeable on various content from the specification for this assessment

The paper was divided into 12 questions. The questions were designed to progress from the lowest number of marks gained to the highest marks, to develop learner confidence whilst progressing through the paper. Questions 1 – 9 allowed learners to address questions from 2 to 5 marks, whilst question 10 to 12 ranged from 8 to 14 marks; requiring an extended response from the learners.

Each question was based on functional anatomy, allowing the learner to demonstrate knowledge, and understanding of a range of specification content. Questions 1 to 10 generally addressed sections A to E of the specification; whilst questions 11 and 12 allowed the learner to demonstrate their knowledge and understanding of the interrelationships of the muscular and skeletal systems in movement analysis.

Questions 1 to 9 on the paper were assessed using a traditional points-based approach, where a mark was given for each appropriate point (more information can be found below in the individual question section of the report).

Questions 10 to 12 required an extended response, and these were marked using a 'levels based' approach to assessment where the overall quality of the response was considered rather than number of facts stated alone.

Individual Sub Tasks/Questions

The following section considers each question on the paper, providing examples of 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.

Q1

This was an accessible question about the location of skeletal muscles. It used a table format with an example already provided for the Soleus. It would be beneficial for learners to consider this format for the skeletal muscles listed in the specification.

Answer ALL questions. Write your answers in the spaces provided.

Table 1 shows a list of skeletal muscles.

The location of one of these muscles has been given.

1 Complete **Table 1** by giving the locations of the other skeletal muscles.

Skeletal muscle	Location
Soleus	Back of the lower leg
Rectus femoris	Front of upper leg
Obliques	(left and right) either side of the trunk
Trapezius	top and middle back
Sternocleidomastoid	in the neck

Table 1

(Total for Question 1 = 4 marks)

This response gained 4 marks
All 4 locations of the skeletal muscles were accurately provided.

A large proportion of learners would state the location of the Sternocleidomastoid in the chest/upper thorax area. Additionally, learners would add a location that could be for other skeletal muscles. For example, for Obliques learners would add 'the trunk' but this could also be the case for the rectus abdominus. Therefore, it was important for the learners to provide specifically where in the trunk "to the side".

Table 1 shows a list of skeletal muscles.

The location of one of these muscles has been given.

1 Complete **Table 1** by giving the locations of the other skeletal muscles.

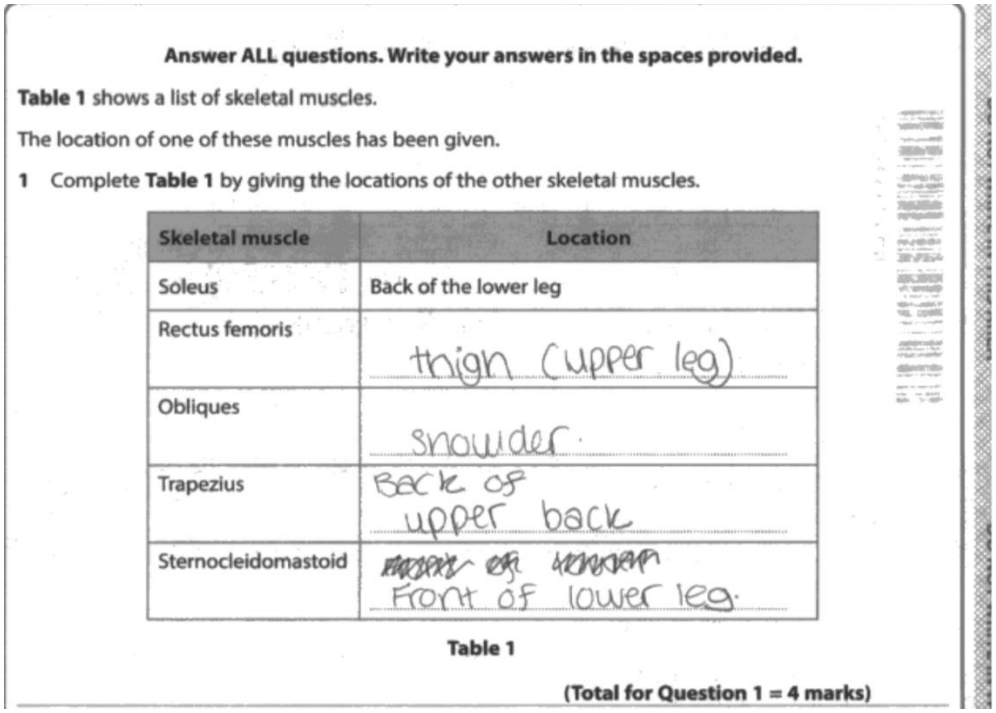
Skeletal muscle	Location
Soleus	Back of the lower leg
Rectus femoris	Back of the upper leg
Obliques	side of the trunk
Trapezius	the upper back
Sternocleidomastoid	side of the neck

Table 1

(Total for Question 1 = 4 marks)

This response gained 3 marks

3 locations were accurately provided. The response for the Rectus femoris is evident of requiring the specific location. This muscle is in the upper leg. However, the muscles in the Hamstrings are in the 'back'. The learner was required to provide 'front of the upper leg' to access the mark



Answer ALL questions. Write your answers in the spaces provided.

Table 1 shows a list of skeletal muscles.

The location of one of these muscles has been given.

1 Complete **Table 1** by giving the locations of the other skeletal muscles.

Skeletal muscle	Location
Soleus	Back of the lower leg
Rectus femoris	thign (upper leg)
Obliques	snoulder
Trapezius	Back of upper back
Sternocleidomastoid	Front of lower leg.

Table 1

(Total for Question 1 = 4 marks)

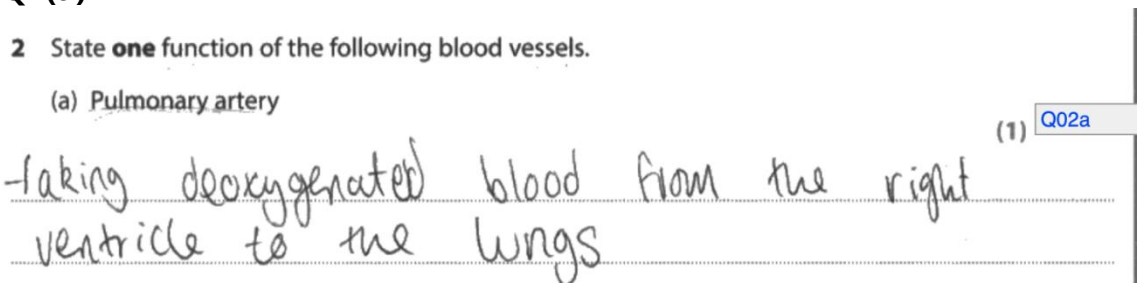
This response gained 1 mark

This response is evidence of the vast array of responses provided in the table. The location provided for the Trapezius is accurate for 1 mark. The location for the Obliques and Sternocleidomastoid is incorrect and the location for the Rectus femoris is too vague.

Q2(a) and (b)

The responses for both parts of this question varied significantly. The function of both blood vessels included deoxygenated blood. Therefore, learners were required to state where the blood vessel directed deoxygenated blood to or from.

Q2(a)



2 State **one** function of the following blood vessels.

(a) Pulmonary artery

(1) Q02a

-taking deoxygenated blood from the right ventricle to the lungs

2 State **one** function of the following blood vessels.

(a) Pulmonary artery

(1)

transports deoxygenated blood away from the heart to the lungs.

Both responses gained 1 mark

The function is clear as the learner has stated where the pulmonary artery takes blood from (heart/right ventricle) and to (the lungs).

In contrast,

2 State **one** function of the following blood vessels.

(a) Pulmonary artery

(1)

pulmonary artery carries blood away from the heart

2 State **one** function of the following blood vessels.

(a) Pulmonary artery

(1)

Takes ~~it~~ oxygenated blood away from the heart

Both responses did not gain any credit.

Both are evident of common mistakes made by learners. The first one is true of the pulmonary artery; however, it is also true of the Aorta and therefore the location "to the lungs" was required. Likewise for the second response, the learner was required to state the right type of blood 'deoxygenated" to gain credit.

Q2(b)

(b) Vena cava

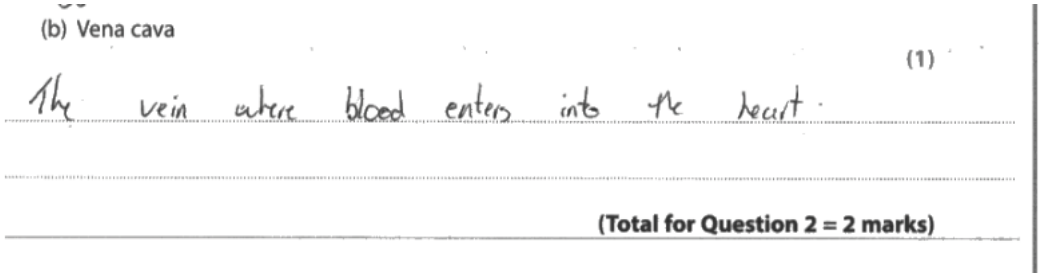
(1) Q02b

taking deoxygenated blood from around the body to the right atrium

(Total for Question 2 = 2 marks) Q02_Total

These responses gained 1 mark
The function is stated accurately.

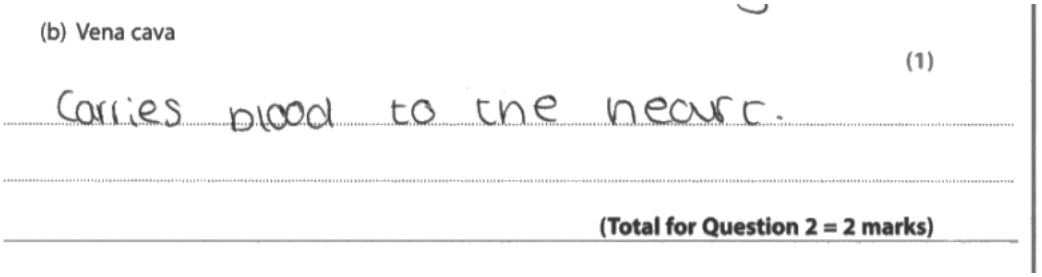
There was a more consistent approach to 2b. However, the responses below are evident of similar mistakes that had also occurred in 2a.


(b) Vena cava

(1)

The vein where blood enters into the heart.

(Total for Question 2 = 2 marks)


(b) Vena cava

(1)

Carries blood to the heart.

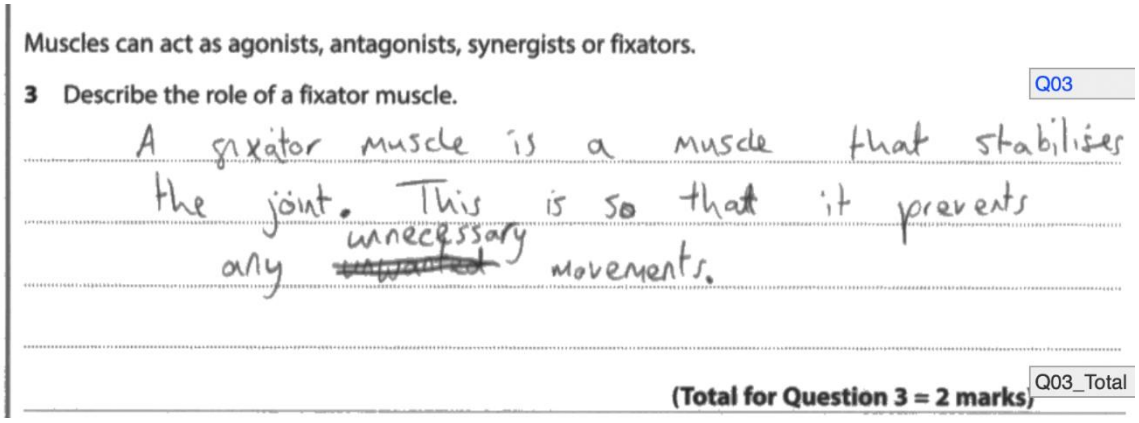
(Total for Question 2 = 2 marks)

These responses gained 0 marks

Both could also be stating the function of the 'pulmonary vein' and therefore needed to state to correct type of blood into the heart or where the vessel is carrying blood from 'the body' or 'muscles/tissues'

Q3.

This question assesses an area of E4 that learners will have only potentially used in the extended analysis question. It is worth noting to all centres that all areas of the unit content can be assessed within this examination. The question was not attempted by a high proportion of learners.
The learners who achieved two marks were able to correctly describe the role of a fixator as stabilisation at the joint to prevent unwanted movement.



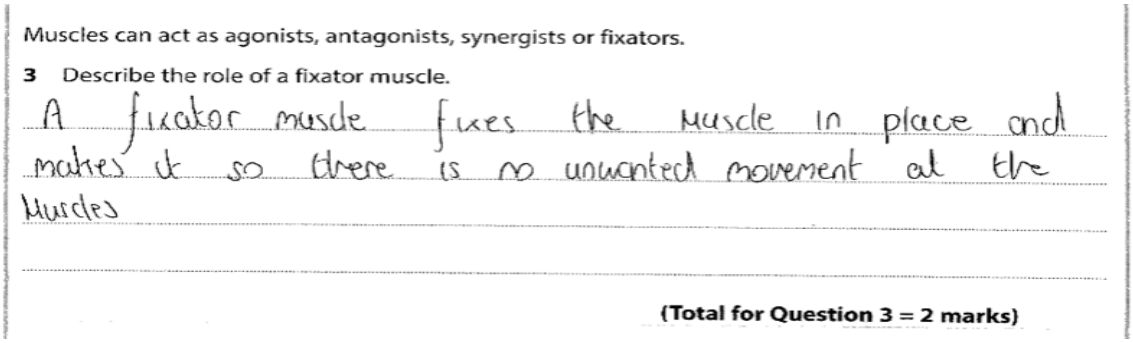
Muscles can act as agonists, antagonists, synergists or fixators.

3 Describe the role of a fixator muscle. Q03

A fixator muscle is a muscle that stabilises the joint. This is so that it prevents any ~~unwanted~~ unnecessary movements.

(Total for Question 3 = 2 marks) Q03_Total

This response gained 2 marks.



Muscles can act as agonists, antagonists, synergists or fixators.

3 Describe the role of a fixator muscle.

A fixator muscle fixes the muscle in place and makes it so there is no unwanted movement at the Muscles

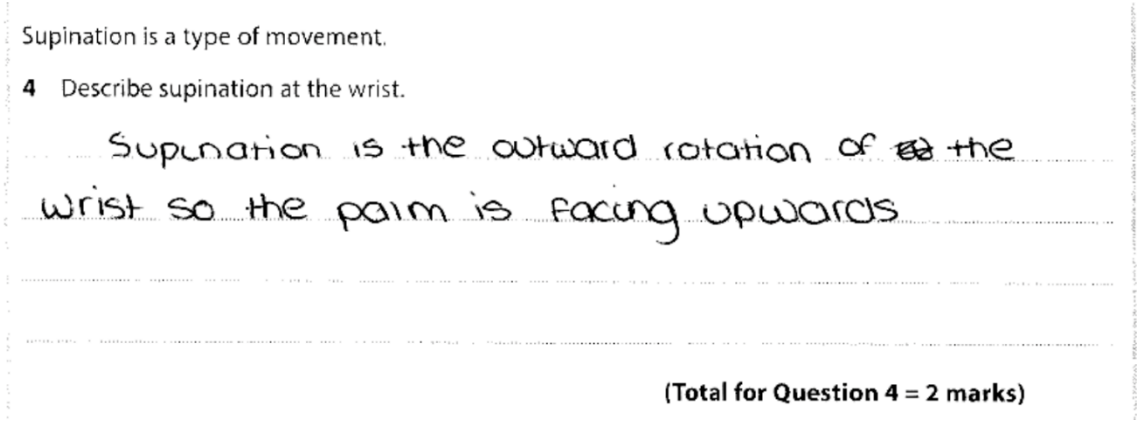
(Total for Question 3 = 2 marks)

This response gained 1 mark

The learner is accurate in linking the function of a fixator to 'no unwanted movement'. The first part of the response demonstrates a common mistake by learners. They would refer to 'fixing' or 'stabilisation' of the muscle, however credit was awarded when they linked stabilisation of the joint or muscle origin.

Q4.

This was an accessible question and mirrored a similar question on a previous series about pronation. Types of movement (section E) that are unlikely to feature in the joints analysed in question 11 and 12 work as short answer question, like this.



Supination is a type of movement.

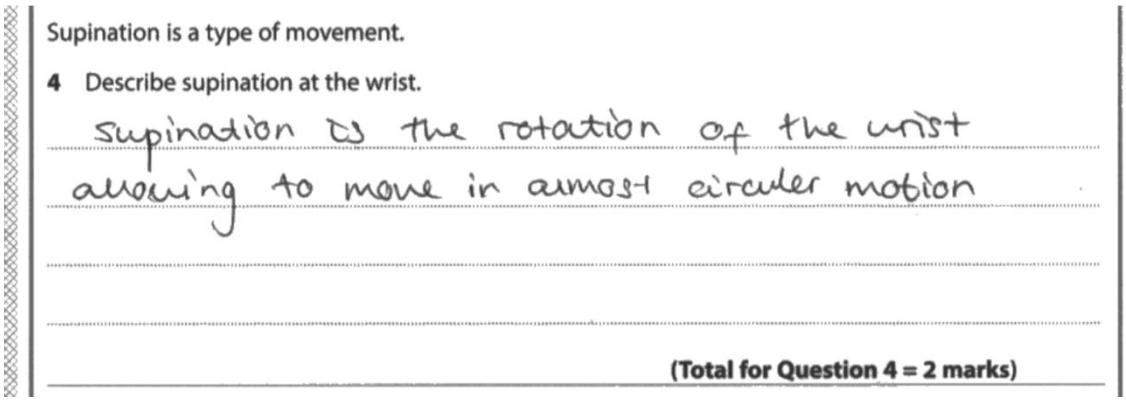
4 Describe supination at the wrist.

Supination is the outward rotation of the wrist so the palm is facing upwards

(Total for Question 4 = 2 marks)

This response gained 2 marks.

The learner accurately describes supination at the wrist as per the mark scheme.



Supination is a type of movement.

4 Describe supination at the wrist.

supination is the rotation of the wrist allowing to move in almost circular motion

(Total for Question 4 = 2 marks)

This response gained 1 mark

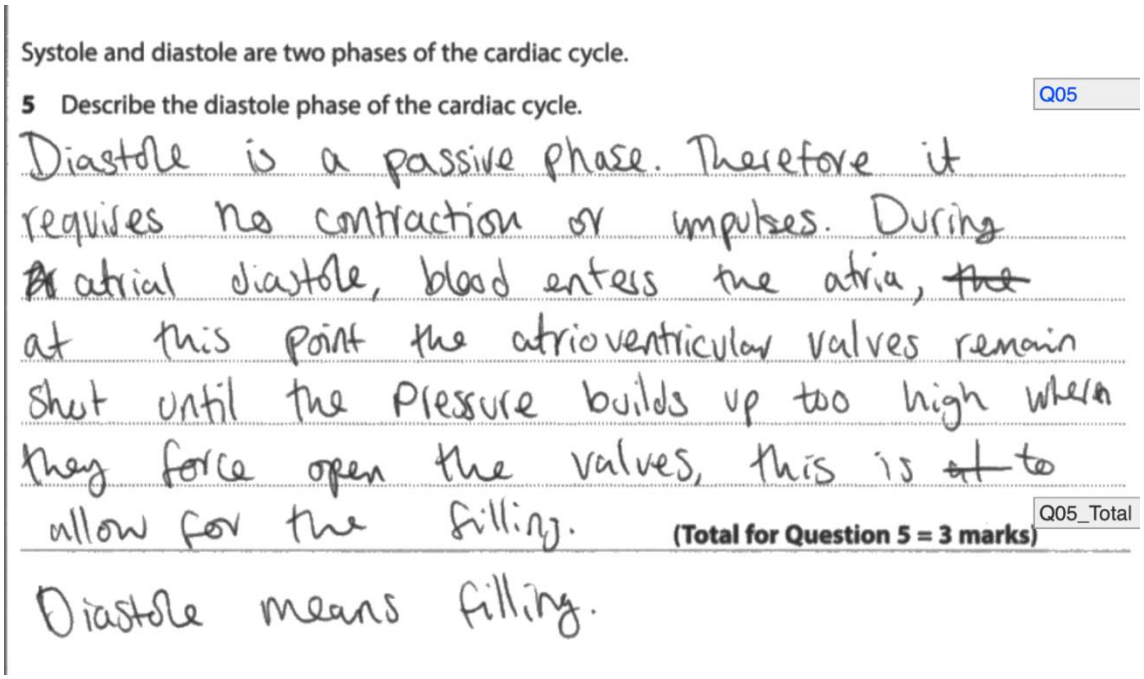
This learner has accurately described the movement as including 'rotation'. There is no linked description of how the wrist/hand/palm presents once supination has occurred.

Q5

This question asked learners to describe the process of diastole in the cardiac cycle.

The command verb is 'describe'. Therefore, to achieve full marks, learners are required to link points about diastole as a process within the cardiac cycle.

Some learners provided descriptions about the phase including relaxation of the heart or chambers within the heart, to fill up with blood. The final marking point, the inclusion of the valves in the heart was regularly missed.



Systole and diastole are two phases of the cardiac cycle.

5 Describe the diastole phase of the cardiac cycle. Q05

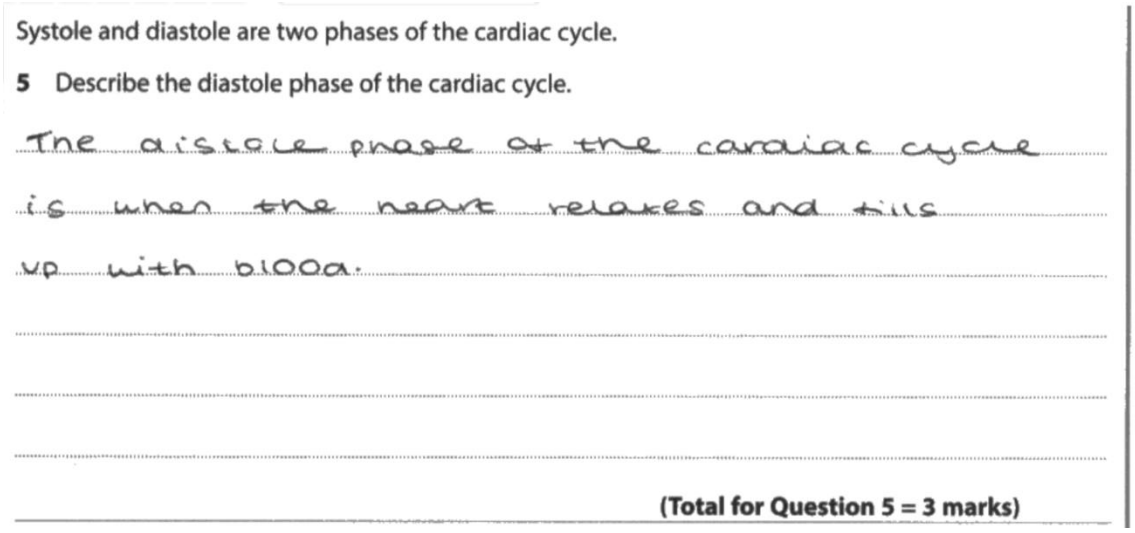
Diastole is a passive phase. Therefore it requires no contraction or impulses. During ~~Br~~ atrial diastole, blood enters the atria, ~~the~~ at this point the atrioventricular valves remain shut until the pressure builds up too high where they force open the valves, this is ~~at~~ to allow for the filling. **(Total for Question 5 = 3 marks)** Q05_Total

Diastole means filling.

This response gained 3 marks.

This response demonstrates all the linked descriptive points as per the mark scheme. The learner starts with knowing diastole is 'passive'. This was a suitable alternative for relaxation. This is linked to the chambers 'filling' or 'blood being allowed to enter the heart'. The final marking point is also evident. The learner has included knowledge of the valves (atrioventricular AV) remaining closed whilst the atria fill with blood.

It is worth noting, the choice of valve was dependent on the learner's description. For example, some would refer to the AV valves remaining open for ventricular diastole or the semilunar valves remaining closed.



Systole and diastole are two phases of the cardiac cycle.

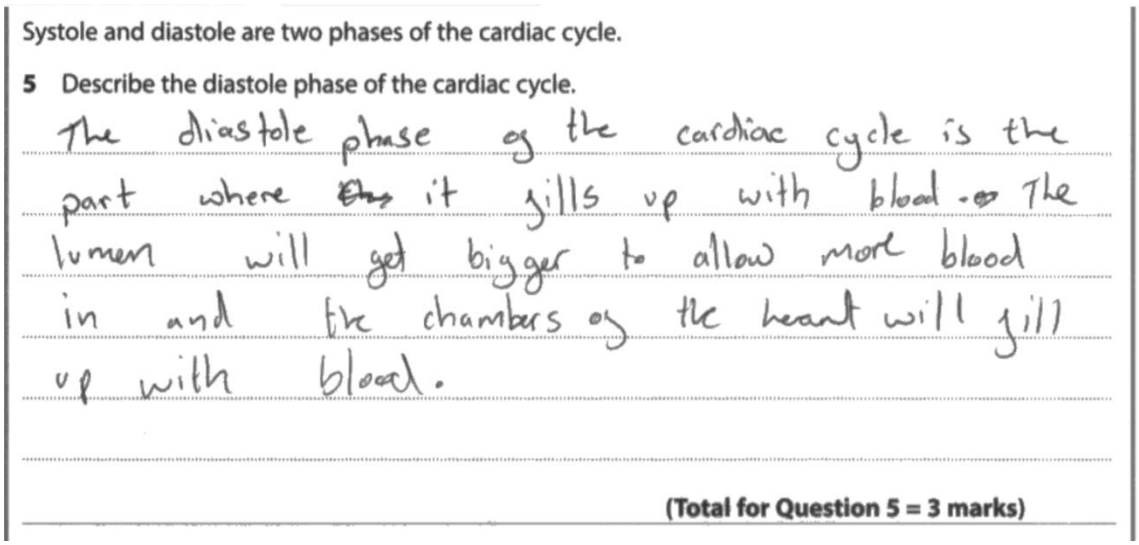
5 Describe the diastole phase of the cardiac cycle.

The diastole phase of the cardiac cycle is when the heart relaxes and fills up with blood.

(Total for Question 5 = 3 marks)

This response gained 2 marks

This demonstrates a common approach to the question. The learner has linked the heart relaxing to fill up with blood.



Systole and diastole are two phases of the cardiac cycle.

5 Describe the diastole phase of the cardiac cycle.

The diastole phase of the cardiac cycle is the part where ~~the~~ it fills up with blood. The lumen will get bigger to allow more blood in and the chambers of the heart will fill up with blood.

(Total for Question 5 = 3 marks)

This response gained 1 mark

This demonstrates a basic approach linking diastole as a 'filling' phase.

Q6a

This question was a relatively highly accessible question and assessed learners' knowledge and understanding of the skeletal system, specifically the regions of the vertebral column.

Figure 1 shows the structure of the vertebral column.

6 (a) Identify the regions labelled A, B and C.

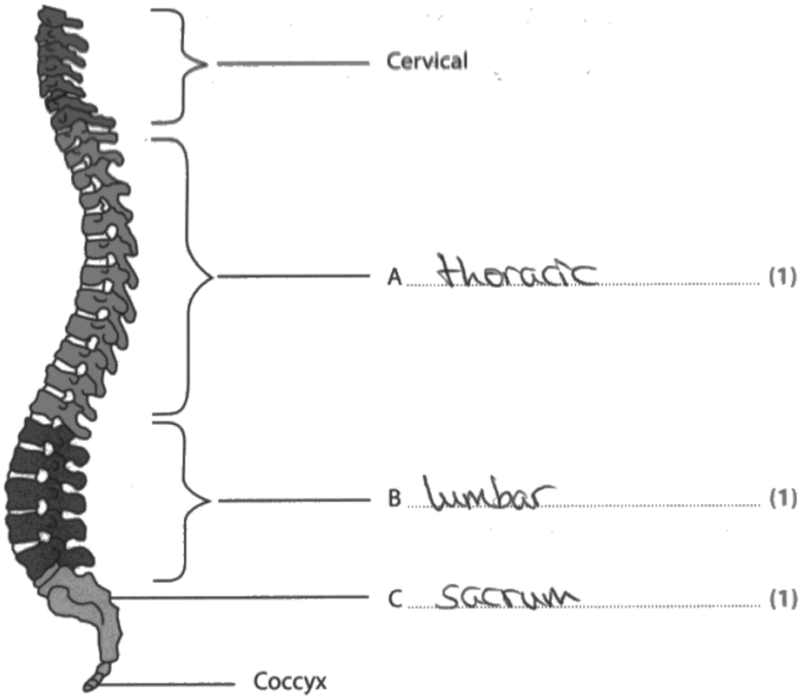
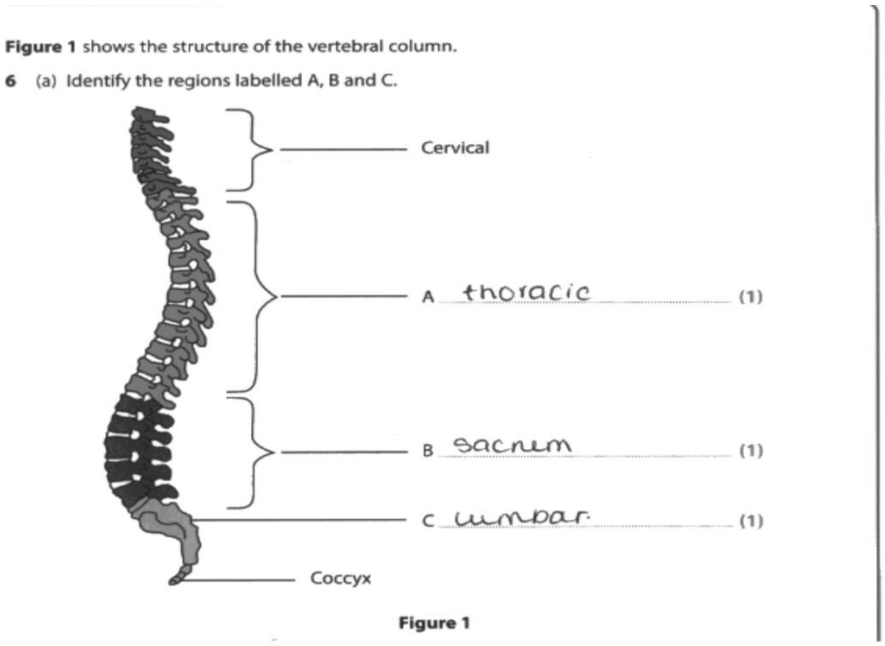


Figure 1

This response gained 3 marks

All 3 regions have been labelled correctly.



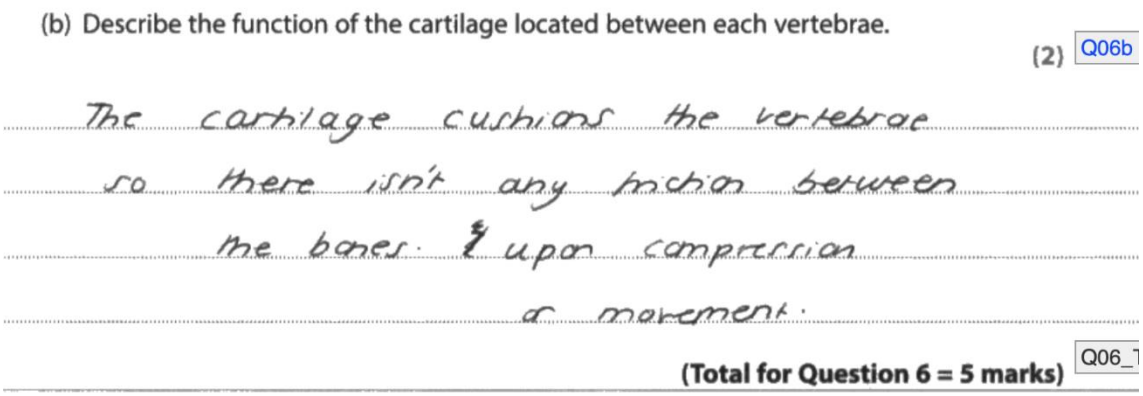
This response gained 1 mark

Thoracic was labelled correctly. This also evidences a common mistake, where learners would identify the regions but in an incorrect order.

Q6b

This question was linked the structure of the vertebral column and assessed learners' knowledge of the function of the cartilage located between each vertebrae.

The command verb was again 'describe'. Therefore, to achieve full marks, learners are required to identify the function and expand their answer with a linked descriptive point.



(b) Describe the function of the cartilage located between each vertebrae.

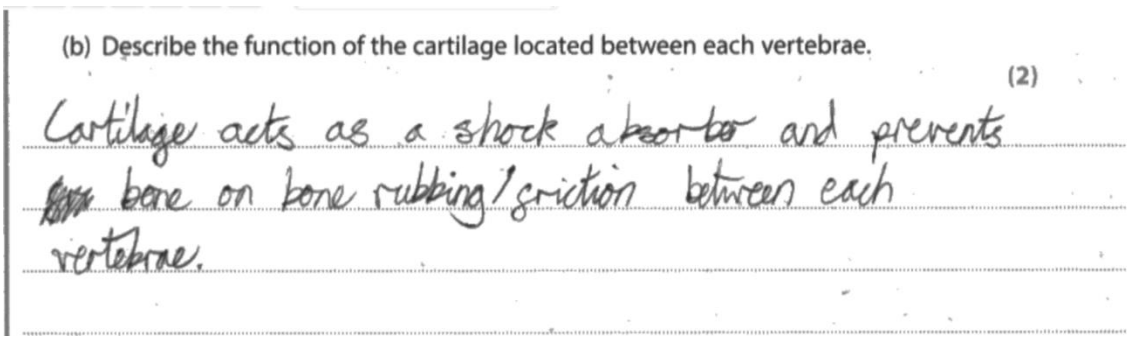
(2) Q06b

The cartilage cushions the vertebrae so there isn't any friction between the bones & upon compression & movement.

(Total for Question 6 = 5 marks) Q06_1

This response gained 2 marks

This learner has accessed both marking points; cushioning (1) to reduce friction (1)



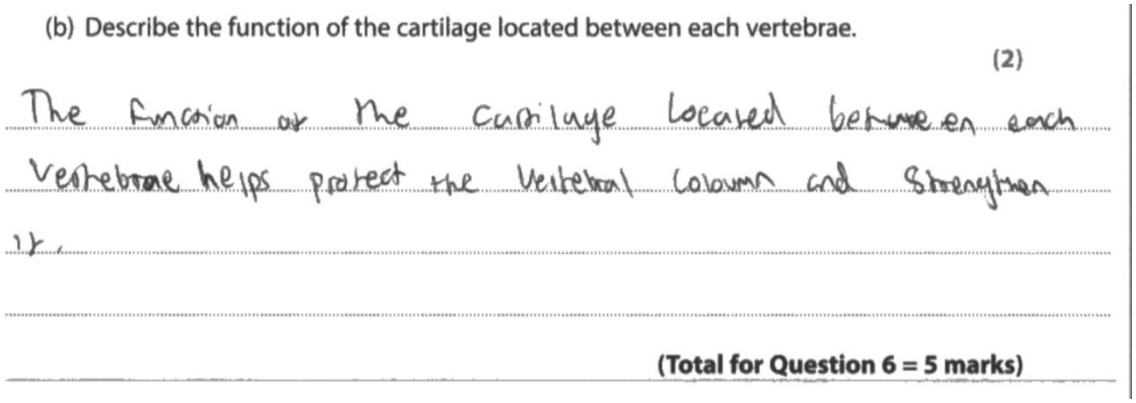
(b) Describe the function of the cartilage located between each vertebrae.

(2)

Cartilage acts as a shock absorber and prevents bone on bone rubbing / friction between each vertebrae.

This response also gained 2 marks

This demonstrates an alternative approach; shock absorption (1) to prevent friction (1). It was common for learners to either use terminology of bones rubbing/grinding. Both were suitable alternatives for 'friction'


(b) Describe the function of the cartilage located between each vertebrae.

(2)

The function of the cartilage located between each vertebrae helps protect the vertebral column and strengthen it.

(Total for Question 6 = 5 marks)

This response gained 0 marks

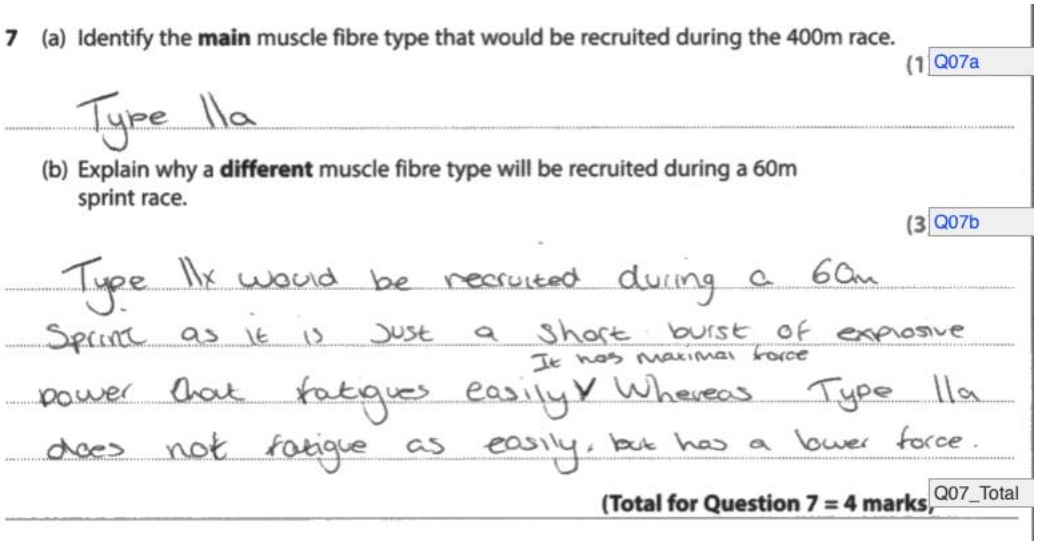
Occasionally, learners would describe the function as 'protection'. This is inaccurate of the cartilage and a description of the vertebrae and therefore did not receive any credit.

Q7a and b

This question showed an image of a 400m sprint race. In the first part of the question, learners were asked to identify the main muscle fibre type recruited in this race

In the second part of the question, the learners were asked to explain 'why' a different muscle fibre type would be recruited for a 60m sprint race; a much shorter and more explosive event.

Most learners would accurately identify Type IIa for 7a and then identify Type IIx for 7b with two further explanations as why Type IIx would be recruited in the 60m event.



7 (a) Identify the **main** muscle fibre type that would be recruited during the 400m race. (1) Q07a

Type IIa

(b) Explain why a **different** muscle fibre type will be recruited during a 60m sprint race. (3) Q07b

Type IIx would be recruited during a 60m Sprint as it is just a short burst of explosive power that fatigues easily (It has maximal force) Whereas Type IIa does not fatigue as easily, but has a lower force.

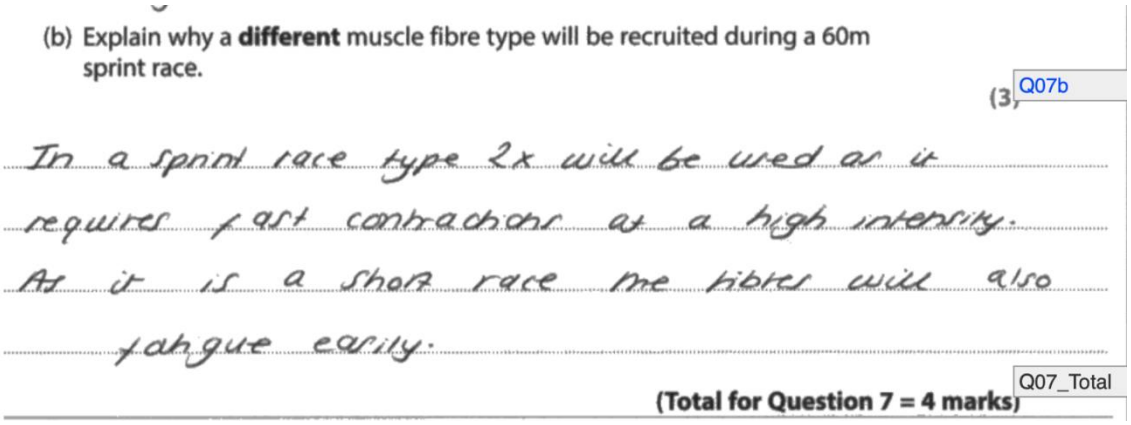
(Total for Question 7 = 4 marks) Q07_Total

This response gained all 4 marks for both question parts

This was typical of those learners accessing full marks on this question. They identified the correct muscle fibre type for 7a (1) and then identified Type IIx for 7b (1) with two linked points; needing more explosive power (1) which fatigues easily (1).

Here the learner uses an explanation of the nature of the event and a muscle fibre characteristic. Both of which gained credit.

Learners would describe the race or distance as being shorter. This was too vague. The distances were already stated in the questions. It was expected the learners would link the distance to the intensity used.



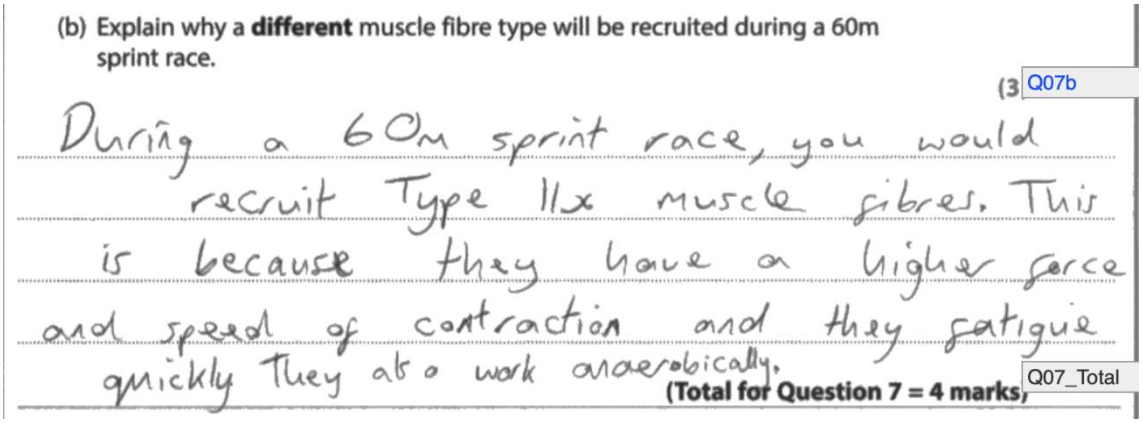
(b) Explain why a **different** muscle fibre type will be recruited during a 60m sprint race. (3) Q07b

In a sprint race type 2x will be used as it requires fast contractions at a high intensity. As it is a short race the fibres will also fatigue easily.

(Total for Question 7 = 4 marks) Q07_Total

This response for 7b also gained 3 marks

The learner identifies the correct muscle fibre type and links this choice to the sprint race requiring high(er) intensity and fast(er) contractions.



(b) Explain why a **different** muscle fibre type will be recruited during a 60m sprint race.

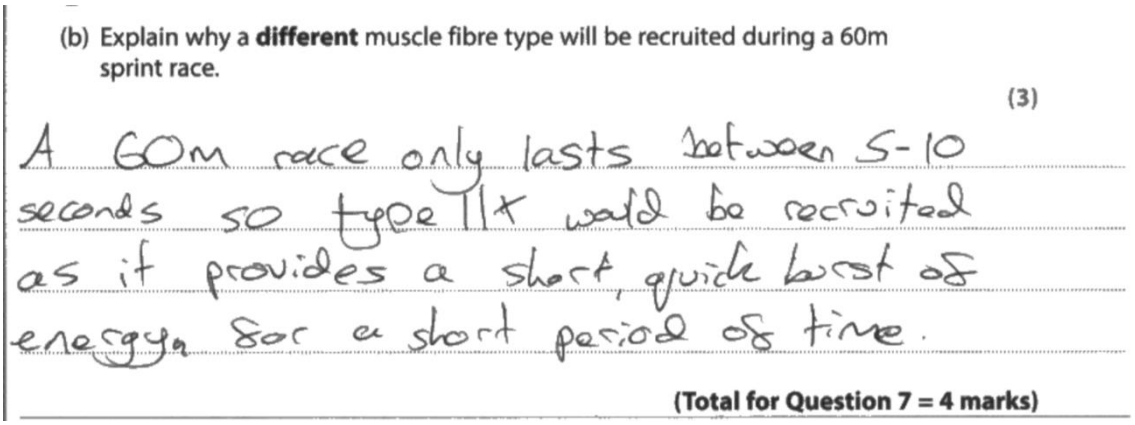
(3) Q07b

During a 60m sprint race, you would recruit Type IIx muscle fibres. This is because they have a higher force and speed of contraction and they fatigue quickly They also work anaerobically.

(Total for Question 7 = 4 marks) Q07_Total

Likewise, this response gained 3 marks

This learner demonstrates the approach of explaining the muscle fibre characteristics; higher force and speed of contraction which are quick to fatigue.



(b) Explain why a **different** muscle fibre type will be recruited during a 60m sprint race.

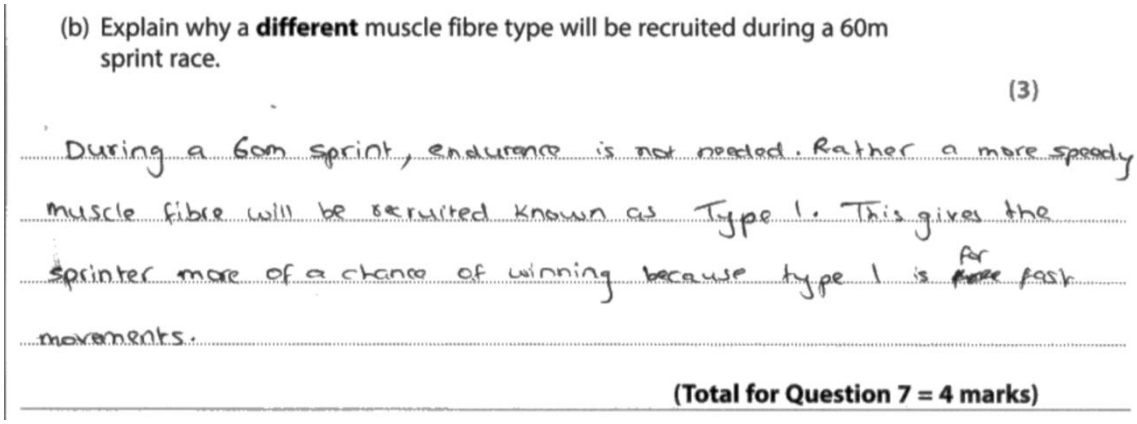
(3)

A 60m race only lasts between 5-10 seconds so type IIx would be recruited as it provides a short, quick burst of energy for a short period of time.

(Total for Question 7 = 4 marks)

This response gained 1 mark

The learner identified Type IIx muscle fibre. …'short' and 'quick burst of energy' were used frequently by learners but were too vague as an explanation of either the 60m race or muscle fibre characteristic.



(b) Explain why a **different** muscle fibre type will be recruited during a 60m sprint race.

(3)

During a 60m sprint, endurance is not needed. Rather a more speedy muscle fibre will be recruited known as Type 1. This gives the sprinter more of a chance of winning because type 1 is for fast movements.

(Total for Question 7 = 4 marks)

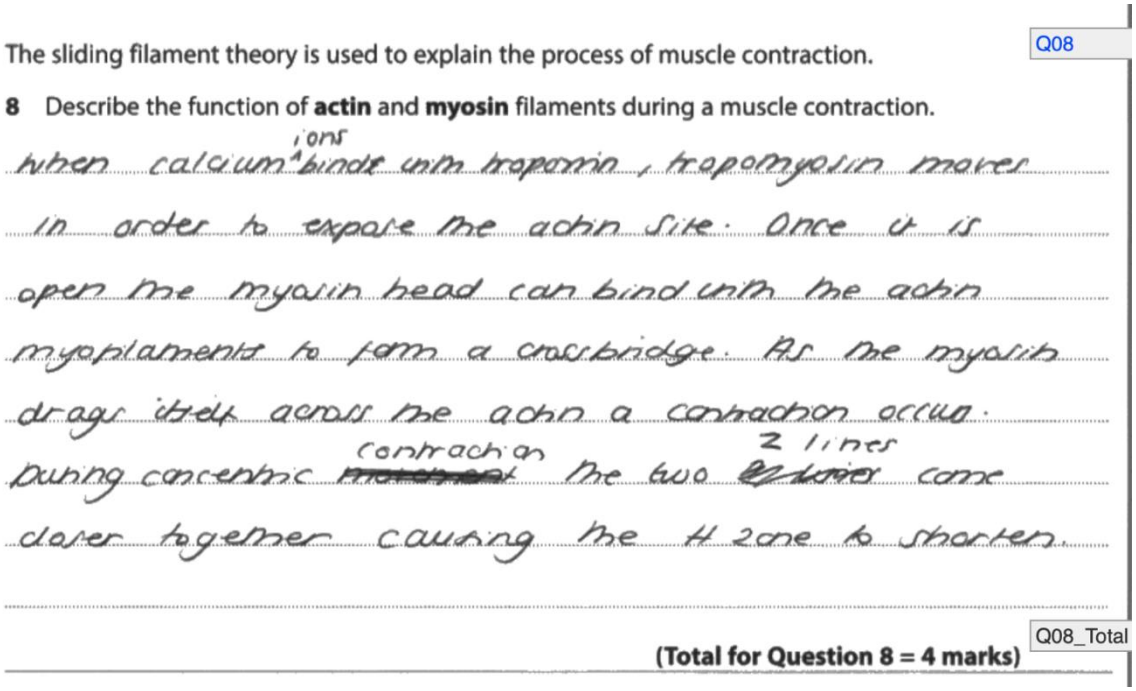
This response gained 0 marks

The learner identified the incorrect muscle fibre type and there was no other creditworthy material to explain why a different fibre would be recruited for the 60m race, compared to 400m race.

Q8

The command verb for this question is 'describe'. Consequently, to gain full marks, learners should provide a logical description of the function of actin and myosin during the sliding filament theory.

This question was designed to be accessible but with sufficient scope to stretch and challenge learners to apply their knowledge and understanding of this part of the unit content. There were some excellent and varied answers, assisted by a previous and similar question as an 8-mark extended question. However, on occasions the question was completely left unanswered. Overall, a confident application of the actin and myosin 'binding' to form a 'crossbridge' was evident in this question.



The sliding filament theory is used to explain the process of muscle contraction. Q08

8 Describe the function of **actin** and **myosin** filaments during a muscle contraction.

when calcium ions bind with troponin, tropomyosin moves in order to expose the actin site. Once it is open the myosin head can bind with the actin myofilaments to form a crossbridge. As the myosin drags itself across the actin a contraction occurs. During concentric ~~contraction~~ contraction the two ~~Z lines~~ Z lines come closer together causing the H zone to shorten.

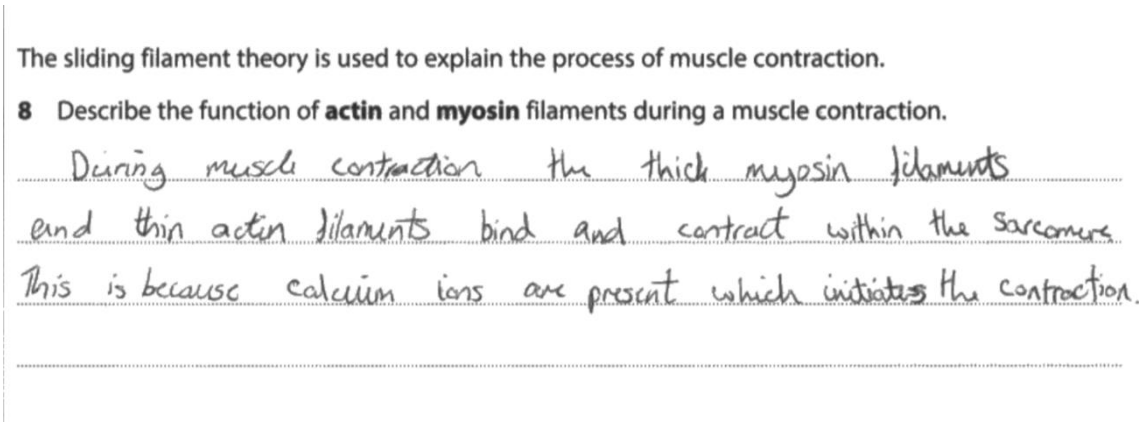
Q08_Total

(Total for Question 8 = 4 marks)

This response gained 4 marks

T

his learner starts with knowledge about the role of tropomyosin (1) so actin and myosin can bind (1) to form a crossbridge (1) which brings the Z lines closer together (1). There was an interchangeable nature of the responses within the mark scheme.



The sliding filament theory is used to explain the process of muscle contraction.

8 Describe the function of **actin** and **myosin** filaments during a muscle contraction.

During muscle contraction the thick myosin filaments and thin actin filaments bind and contract within the sarcomere. This is because calcium ions are present which initiates the contraction.

This response gained 1 mark.

The learner shows understanding of the function of actin and myosin to bind.

Q9

Osteoblasts, Osteoclasts and Osteocytes are areas of the specification frequently assessed. However, in this question learners were asked to describe the process of ossification.

There was a vast continuum of answers, and it was often left unanswered. In summary the learners would appear to revert to a default answer about bone remodelling rather than the process of ossification.

At pass level, learners would accurately state that ossification was a process of bone formation.

9 Describe the process of **ossification**.

Ossification is the process of forming hard, dense bone. It takes place in the growth (epiphseal) plates in the cartilage (at the end of long bones) where calcium is reabsorbed to mineralise collagen to form the new bone. When maturity is reached, the ~~epi~~ epiphseal plate fuses to form the diaphseal line and no more growth can take place.

(Total for Question 9 = 4 marks)

This response gained 4 marks

The response has started with the process of forming bone (1), accompanied with a linked description of where the process takes place 'epiphyseal plates' (1) as cartilage (1) to form new bone (1). This response also shows an accurate description of the use of minerals (calcium) and the process continuing until maturity, both of which were also creditworthy as per the mark scheme.

9 Describe the process of **ossification**.

Ossification is the process of bone growth. Ossification is when the bones are growing until maturity. After maturity our bones will start to stop growing as they can't get bigger than the muscle.

This response gained 2 marks

Process of bone growth (1) until maturity (1)

Ossification is the formation of new bone. old Bone is broken down by osteoclasts so osteoblasts can form new and healthy bone. Osteocytes kill away old and new bone. This can be a problem. This is why when we exercise our osteoblasts are more active which form new bone.

(Total for Question 9 = 4 marks)

This response gained 1 mark

The response is evident of an approach chosen by a high proportion of learners. It is very typical of responses achieving just 1 mark. They would include in their description the role of osteoclasts, osteoblasts, and osteocytes, which received no credit.
It did however start with the process of forming new bone (1).

Q10

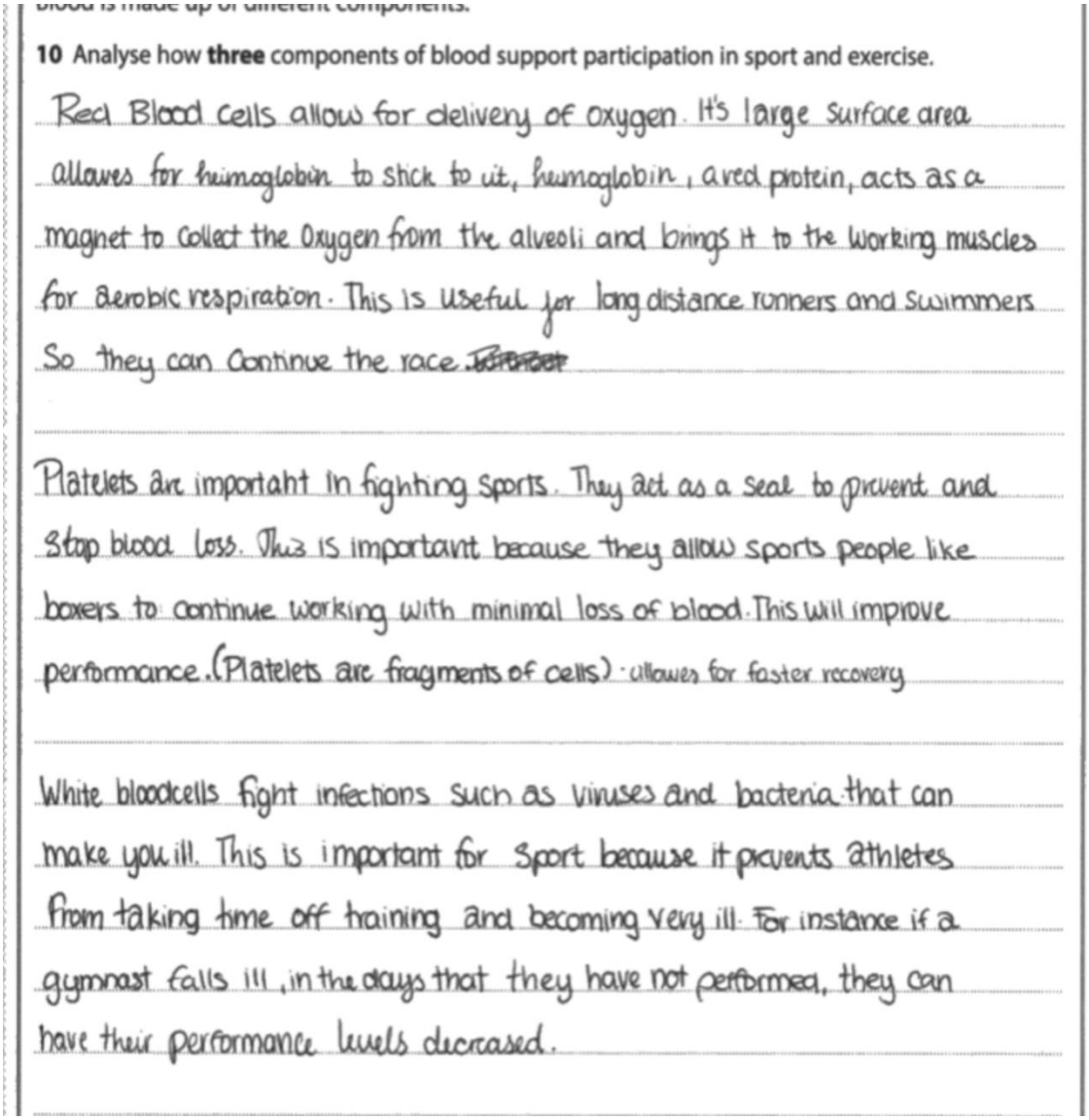
Responses to extended answer questions are marked using levels-based mark schemes, with the quality of the response determining the level. There are four levels; level 0 where there is no rewardable material presented and then levels 1, 2 and 3; the higher the level the better the quality of response.

This question uses the command verb analyse. This requires learners to examine a topic in detail, breaking it down into its component parts and explaining how each part contributes to the other, and in this instance support participation in sport and exercise.

The question asks learners to analyse three **components** of blood**.**

There were some excellent answers, breaking down in accurate detail each component of blood with a relevant description and clear link to how the component supports participation in sport and exercise. This link is where differentiation between level 2 and level 3 responses occurred.

This was typical of a level 3 response.



10 Analyse how **three** components of blood support participation in sport and exercise.

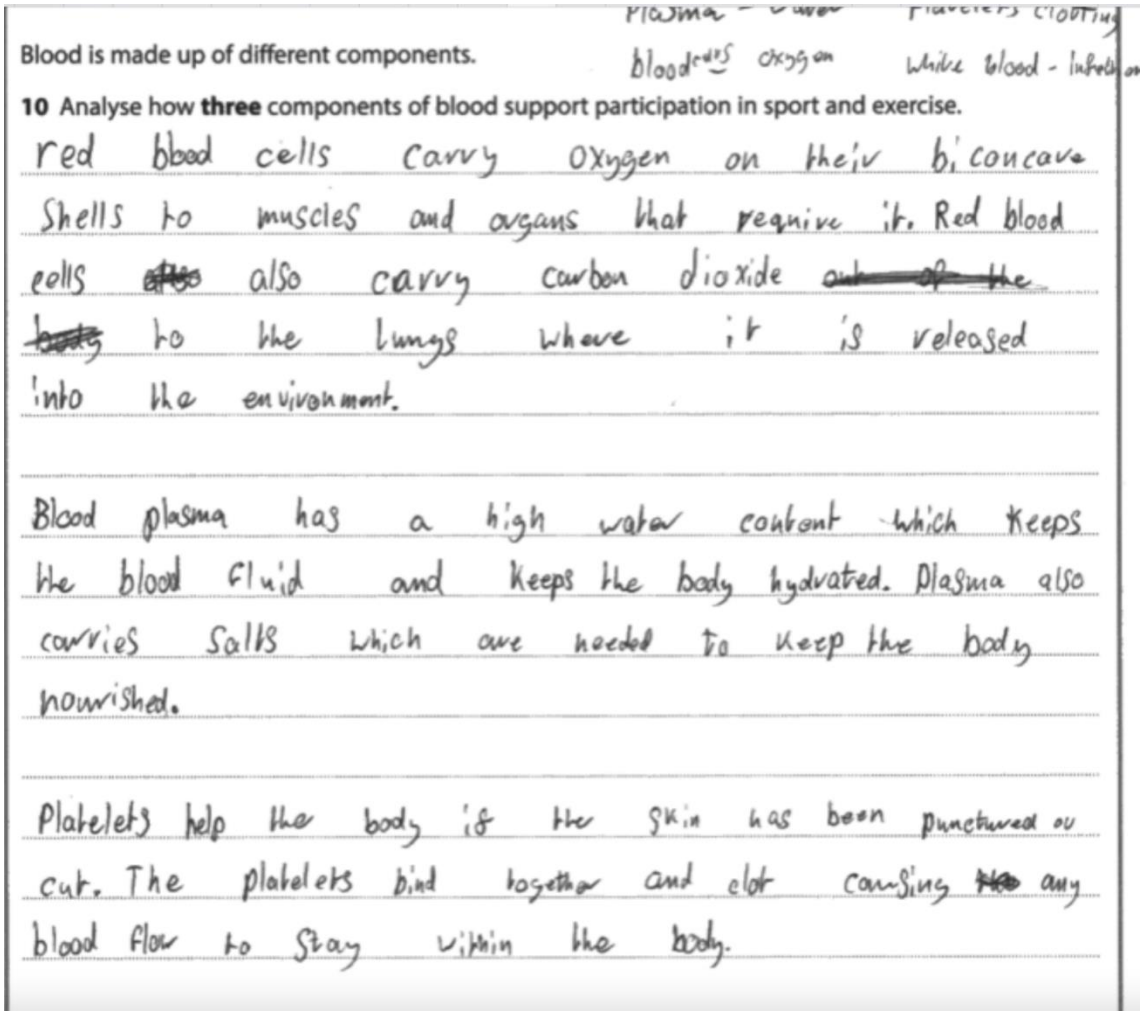
Red Blood cells allow for delivery of oxygen. It's large surface area allowes for haimoglobin to stick to it, haemoglobin, a red protein, acts as a magnet to collect the Oxygen from the alveoli and brings it to the working muscles for aerobic respiration. This is useful for long distance runners and swimmers so they can continue the race.

Platelets are important in fighting sports. They act as a seal to prevent and stop blood loss. This is important because they allow sports people like boxers to continue working with minimal loss of blood. This will improve performance. (Platelets are fragments of cells) · allowes for faster recovery

White bloodcells fight infections such as viruses and bacteria that can make you ill. This is important for sport because it prevents athletes from taking time off training and becoming very ill. For instance if a gymnast falls ill, in the days that they have not performed, they can have their performance levels decreased.

This response gained 8 marks

The learner has provided full analysis of 3 components of blood: red blood cells, platelets, and white blood cells. Each component was described which a clear link to how each supports sport and exercise.



Blood is made up of different components.

10 Analyse how **three** components of blood support participation in sport and exercise.

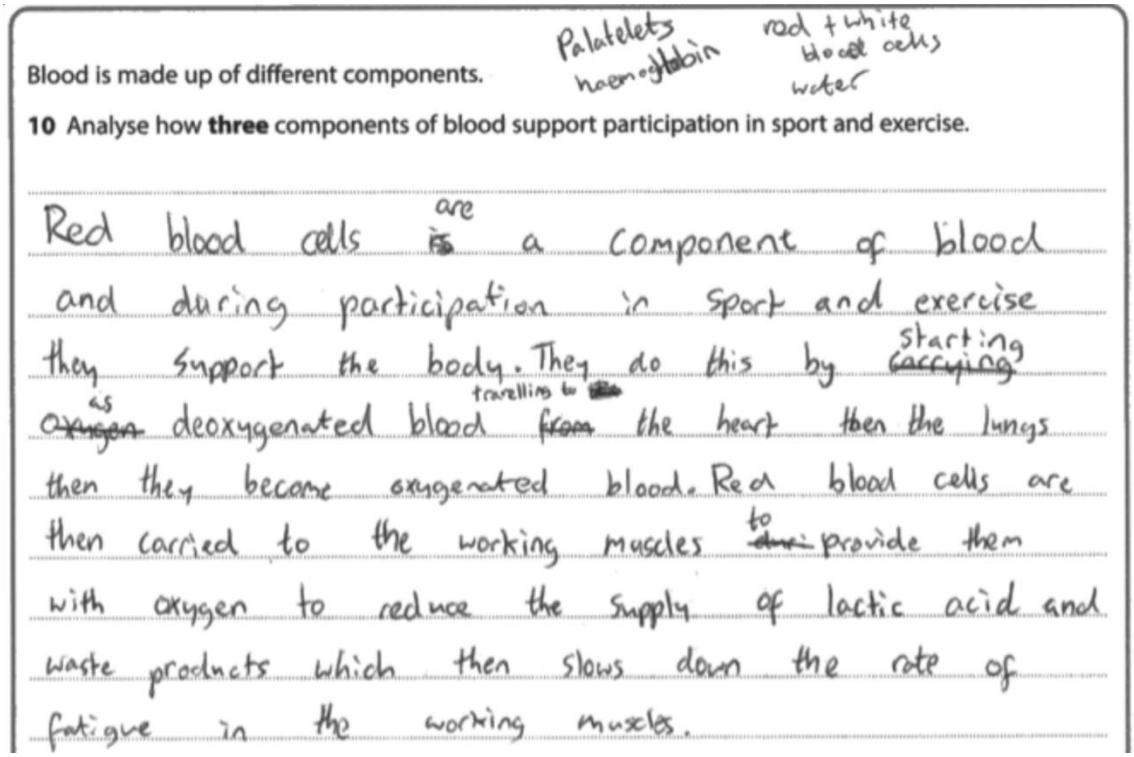
red blood cells carry oxygen on their bi concave shells to muscles and organs that require it. Red blood cells ~~also~~ also carry carbon dioxide ~~out of the body~~ to the lungs where it is released into the environment.

Blood plasma has a high water content which keeps the blood fluid and keeps the body hydrated. Plasma also carries salts which are needed to keep the body nourished.

Platelets help the body if the skin has been punctured or cut. The platelets bind together and clot causing ~~the~~ any blood flow to stay within the body.

This response gained 6 marks

This is an example of a typical level 2 response seen in this series. The learner has identified three components of blood.
They have referenced accurate material from the indicative content to demonstrate an
understanding of each component
There is no analysis of how each supports sport and exercise to reach level 3.



Blood is made up of different components. Palatelets haemoglobin red + white blood cells water

10 Analyse how **three** components of blood support participation in sport and exercise.

Red blood cells ~~is~~ are a component of blood and during participation in sport and exercise they support the body. They do this by ~~carrying~~ starting as ~~oxygen~~ deoxygenated blood travelling to ~~from~~ the heart then the lungs then they become oxygenated blood. Red blood cells are then carried to the working muscles ~~due~~ to provide them with oxygen to reduce the supply of lactic acid and waste products which then slows down the rate of fatigue in the working muscles.

This response gained 2 marks

This response is an example of a level 1 response. A paragraph of just one component of blood
In this response the learner has shown isolated knowledge of red blood cells and links this to supporting the working muscles during exercise to reduce the build-up of lactic acid.

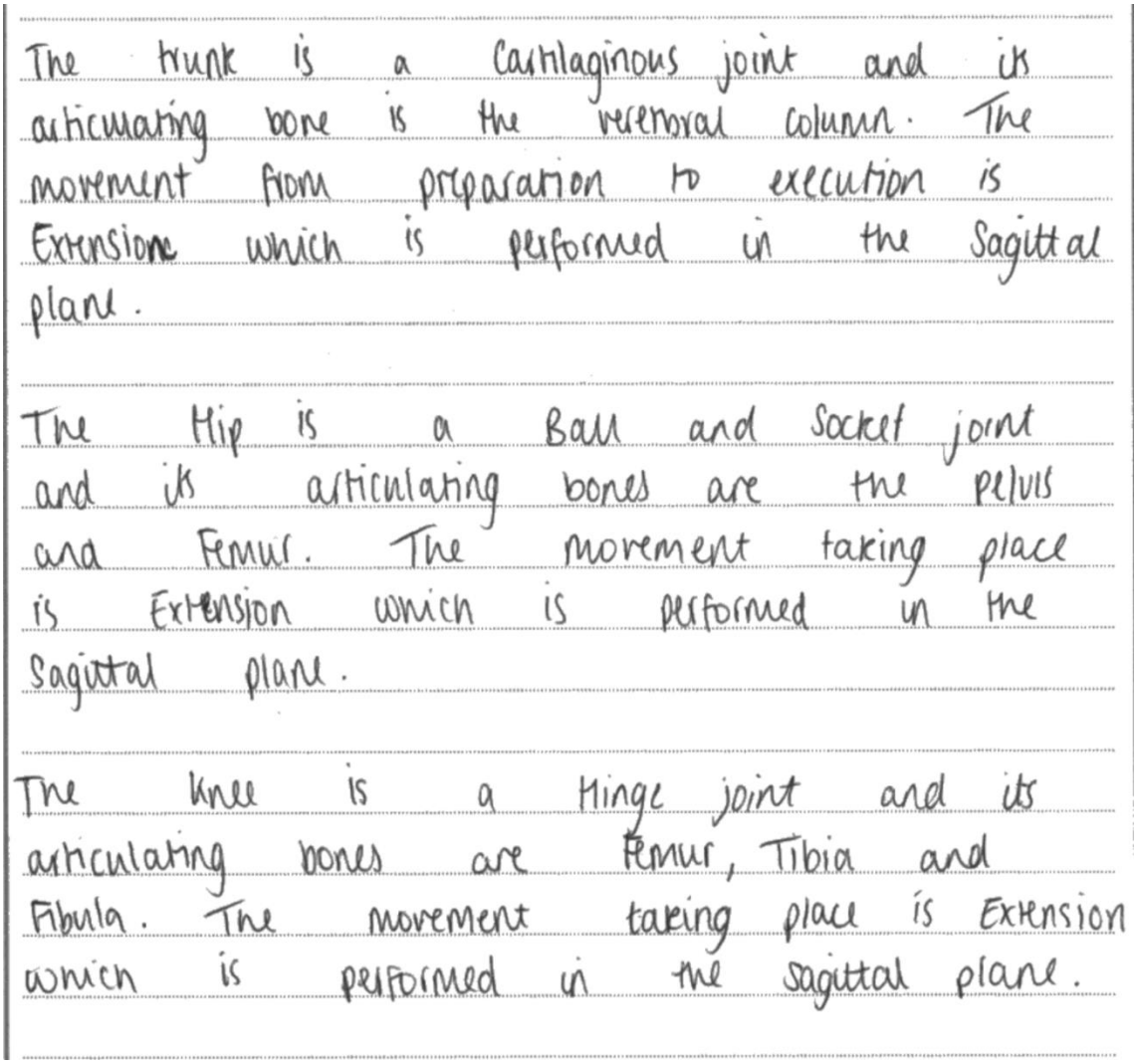
Q11

This is another extended answer question using a levels-based mark scheme. Learners achieved a good spread of marks for this question. The most accessible marks here were for knowledge of the types of joint involved and the articulating bones at these joints.

Almost all learners achieved at least marks in the Level 2 grade descriptor for this question. A good proportion of learners demonstrated a sufficient

breadth and depth of accurate knowledge and understanding to achieve marks from the Level 3 grade descriptor. It was promising to see a so many of these learners providing a full analysis that demonstrated sustained knowledge of interrelationships and linked these to the context of the yoga movement.

A very small number of learners still referred to the muscular system detailing antagonistic muscle pairs and the types of contraction taking place in each. It was positive to see that centres and learners are however not doing this and responding to lead examiner report. The question only asks about the axial and appendicular skeletal system so no credit could be awarded for parts of the learner responses related to the muscular system. The space provided to answer this question should be a guide of the amount of detail the learners are expected to include.



The trunk is a Cartilaginous joint and its articulating bone is the vertebral column. The movement from preparation to execution is Extension which is performed in the Sagittal plane.

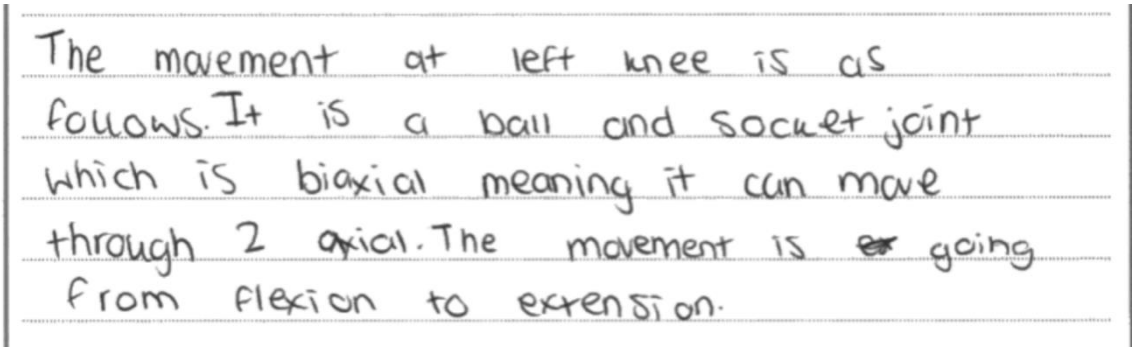
The Hip is a Ball and Socket joint and its articulating bones are the pelvis and Femur. The movement taking place is Extension which is performed in the Sagittal plane.

The knee is a Hinge joint and its articulating bones are Femur, Tibia and Fibula. The movement taking place is Extension which is performed in the sagittal plane.

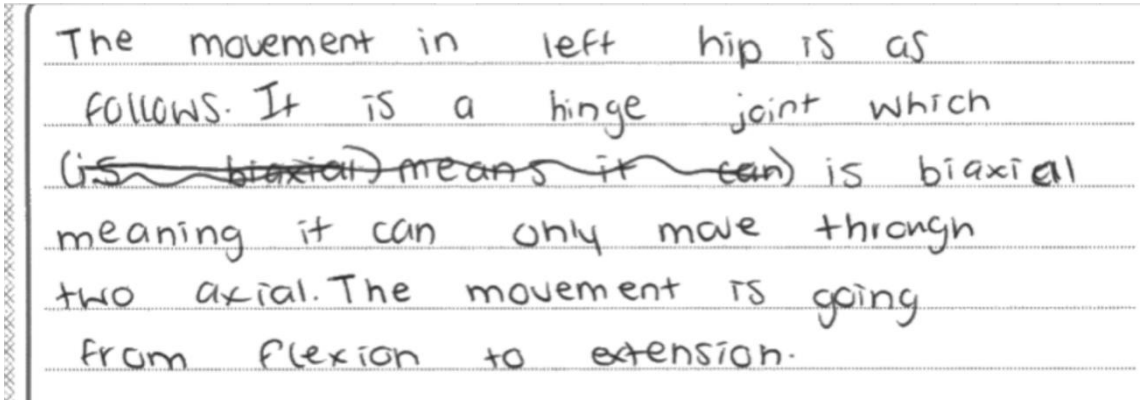
This response gained 8 marks

Learner has provided a full analysis for all 3 joints. The type of joint, articulating bones, joint and plane of movement are all evident and contextualised for the movement. The learner has shown good linkage and integrated the correct plane for all three joints. The identification of extension of the hip and trunk was credited accordingly as this was the more challenging aspect of the analysis.

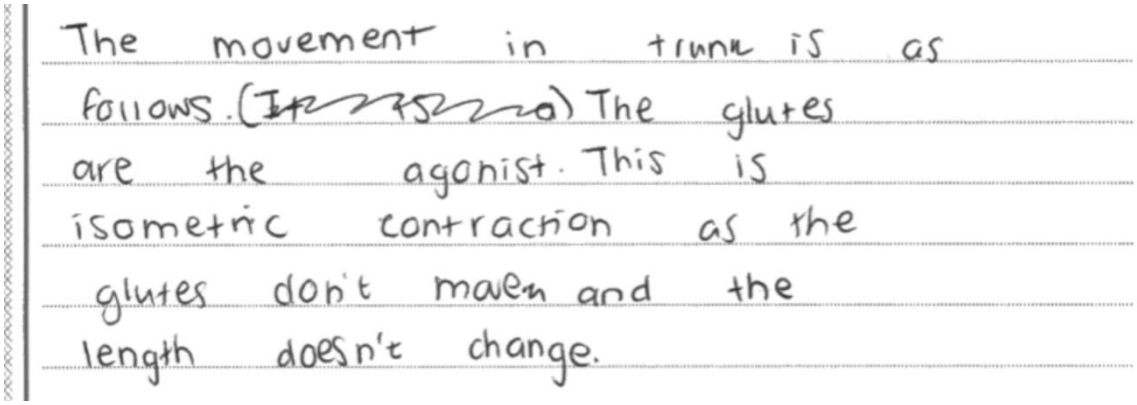
This response also demonstrates how full analysis can be achieved in three concise paragraphs which focus on the execution phase only. This was very much in line with well-planned out and executed responses for the question in this series. Learners should be congratulated on their hard work and regular practice of analyse joints within sporting movements.



The movement at left knee is as follows. It is a ball and socket joint which is biaxial meaning it can move through 2 axial. The movement is ~~er~~ going from flexion to extension.



The movement in left hip is as follows. It is a hinge joint which ~~(is biaxial) means it can~~ is biaxial meaning it can only move through two axial. The movement is going from flexion to extension.


The movement in trunk is as follows. (1 ~~2~~) The glutes are the agonist. This is isometric contraction as the glutes don't move and the length doesn't change.

This response gained 2 marks

There is isolated knowledge and the correct movement at the knee and hip is evident.

Q12

This question is intended to be one of the most demanding on the paper. The question requires learners to analyse the movement of the shoulder, elbow, and ankle to achieve the position shown from preparation phase to execution phase when a goalkeeper is saving a shot in football.

Again, learners seem to have been prepared to answer movement analysis questions and have plans and systems in place to help them do so.

A high proportion of learners have delivered a structured response based on a pre-planned strategy, often shown by tables that were drawn at the start of the learners' response or the diagram being annotated.

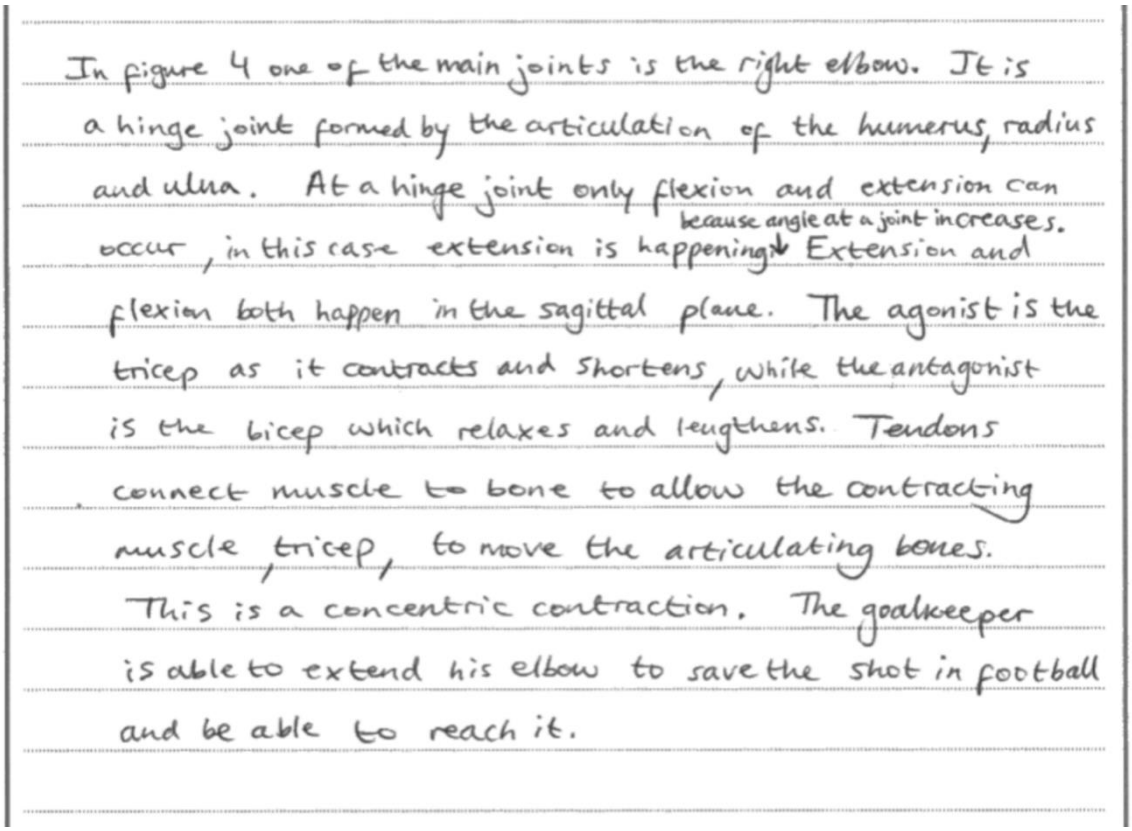
Several factors make this question accessible with suitable stretch and challenge to learners. All joints have been assessed before and generally learners accurately analysed the type of joint, the articulating bones, plane of movement for the elbow and ankle. A number also included the correct antagonistic muscle pairs and types of contraction, particularly for extension of the knee. Learners should be congratulated on the use of a succinct analysis with only focus on the execution phases as requested by the question.

The antagonistic muscle pairs at the shoulder and ankle were stated, although occasionally the agonistic pairing was analysed the wrong way. The muscles and movement involved at the shoulder seemed to prove

slightly more challenge to learners. Like Q11, where these were identified they were credited accordingly.

A very small number of learners still delivered a response that tackled an analysis of the position at preparation followed by another full analysis of the position at execution, rather than addressing the movement between the two phases.

A pleasing number of learners were able to accurately analyse with the sufficient detail as per the mark scheme most of the component parts that are working together to allow the save from preparation to execution and achieved marks in the level 3 grade descriptor.



In figure 4 one of the main joints is the right elbow. It is a hinge joint formed by the articulation of the humerus, radius and ulna. At a hinge joint only flexion and extension can occur, in this case extension is happening (because angle at a joint increases). Extension and flexion both happen in the sagittal plane. The agonist is the tricep as it contracts and shortens, while the antagonist is the bicep which relaxes and lengthens. Tendons connect muscle to bone to allow the contracting muscle, tricep, to move the articulating bones. This is a concentric contraction. The goalkeeper is able to extend his elbow to save the shot in football and be able to reach it.

The shoulder is also a main joint in figure 4, It is a ball and socket joint formed by the articulation of the scapula and humerus. Abduction is occuring because there is movement away from the midline of the body. This movement occurs in the frontal plane. The agonist is the medial deltoid which contracts and shortens, while the antagonist is the latissimus dorsi which relaxes and lengthens. Tendons connect muscle to bone and allow the medial deltoid to move the articulating bones humerus and scapula. This is a concentric contraction. The movement at the shoulder allows the goalkeeper to extend even further to save the shot.

The ankle as shown in figure 4 is another main joint to saving the shot. It is a hinge joint formed by the articulating bones of tibia, fibula and tarsals. The ankle is a special type of hinge joint which has its own movements. In this case plantar-flexion is occuring when the angle increases. Plantar-flexion occurs in the sagittal plane. The agonist is the gastrocnemius which contracts and shortens, while the antagonist is tibialis anterior which relaxes and lengthens. This is a concentric contraction. This movement allows the goalkeeper to jump higher to reach and save the shot.

This response gained 14 marks

This is an example of a learner who has opted to analyse just the execution phase. The learner demonstrates full analysis of each joint breaking down each component into equal parts and linking to the context for the goalkeeper. Therefore, it receives a mark which represents a level 3 grade descriptor.

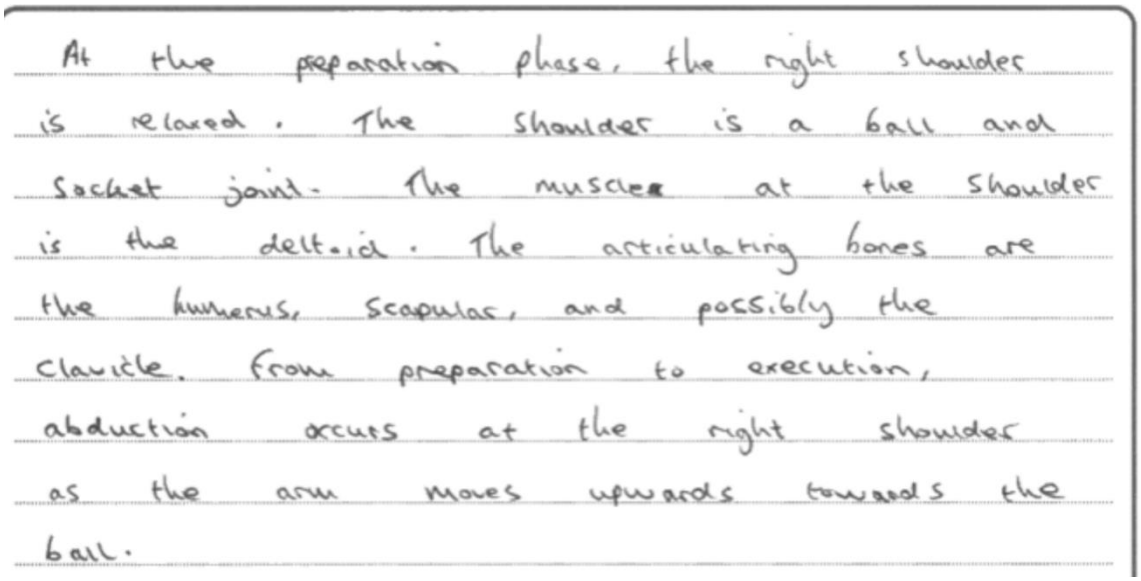
12 Analyse the required movement at the:

- right elbow ✓
- right shoulder ✓
- right ankle ✓

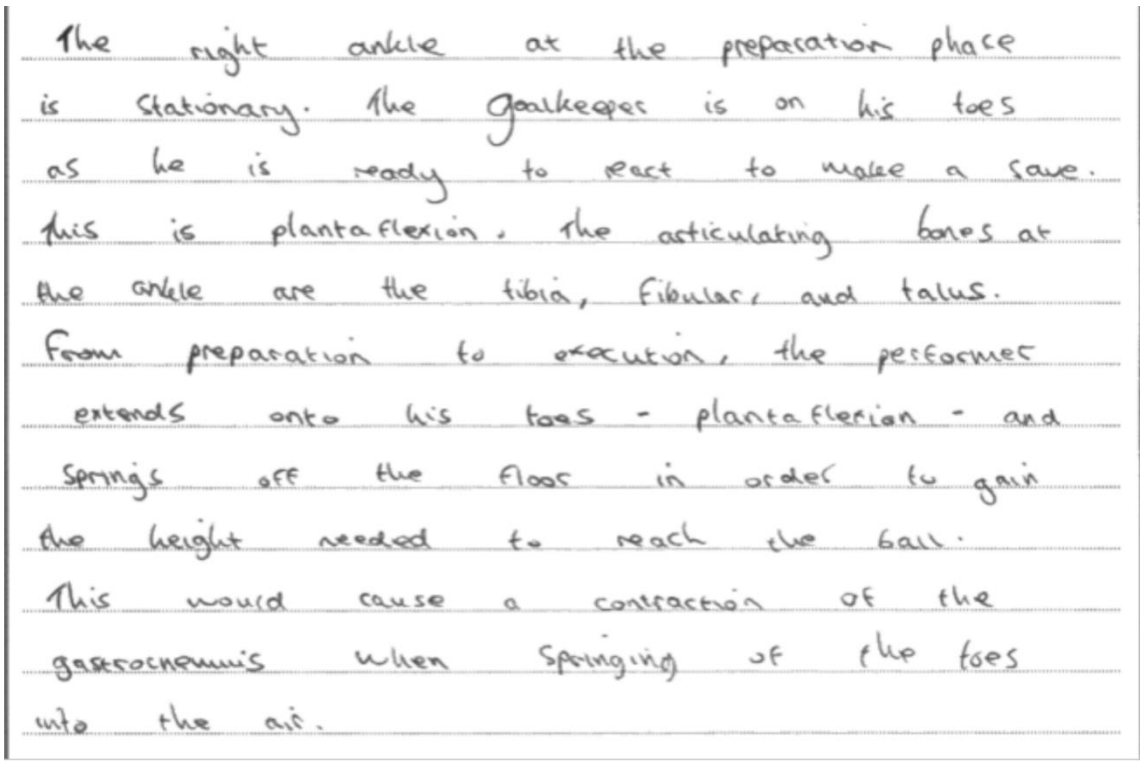
to move from the preparation phase to the **execution** phase.

(14)

At the preparation phase of the movement, flexion occurs at the right elbow. The elbow is a hinge joint. The articulating bones are the radius, ulnar, and humerus. At the execution phase of the movement, extension occurs at the right elbow as the goal keeper extends outwards in an effort to save the ball.



At the preparation phase, the right shoulder is relaxed. The shoulder is a ball and socket joint. The muscles at the shoulder is the deltoid. The articulating bones are the humerus, scapular, and possibly the clavicle. From preparation to execution, abduction occurs at the right shoulder as the arm moves upwards towards the ball.



The right ankle at the preparation phase is stationary. The goalkeeper is on his toes as he is ready to react to make a save. this is plantaflexion. The articulating bones at the ankle are the tibia, fibular, and talus. From preparation to execution, the performer extends onto his toes - plantaflexion - and springs off the floor in order to gain the height needed to reach the ball. This would cause a contraction of the gastrocnemius when springing of the toes into the air.

This response gained 5 marks

This response demonstrates some accurate knowledge as per the level 2 descriptor.
Elbow: the learner has completed some analysis of the type of joint, bones and movement.

Shoulder: partial analysis including type of joint, articulating bones and type of movement
Ankle: likewise, the learner has completed a partial analysis including the movement, bones and identification of muscle involved at the ankle.

Summary

Based on their performance on this paper learners are offered the following advice:

- Recognise that all areas of the unit content can be assessed, and it is worth noting any gaps of topics not yet examined.
- Read all questions carefully to ensure full understanding of what is being asked.
- Identify keywords in a question - possibly underline or highlight these to draw attention to them.
- Understand the different command verbs (e.g., describe, explain, analyse) to establish the requirements of each question.
- Understand terminology used in the specification as these words will be repeated in the exam paper.
- Use appropriate technical language throughout responses as this will support the demonstration of accurate anatomical knowledge.
- Use the number of marks as a guide to the depth of response required.
- Refer to the previous exam papers to become familiar with the structure of the exam and expected responses, particularly for question 11 and question 12.
- In question 11 and 12, continue to focus on the movement from the preparatory phase to execution phase for analysis and use this report to appreciate what is required for full analysis for each joint asked in the question.
- In question 12 ensure analysis includes the correct agonist and antagonist muscle, in the correct order to create the movement required at the joint.

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