Examiners' Report
Lead Examiner Feedback

June 2022

Pearson BTEC Nationals
In BTEC Sport & Exercise Science (31814H)
Unit 2: Functional Anatomy

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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 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.

Introduction

This report has been written to help you understand how learners have performed overall in the exam. For each question, there is a brief analysis of learner responses. You will also find learner responses to the questions, both well and poorly answered. We hope this will help you prepare your learners for future examination series.

The report should be considered with the live external assessment and corresponding mark scheme.

Introduction to the Overall Performance of the Unit

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 1 to 4 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 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.

Q1a

This was an accessible question about the location of components of the heart. It used a heart diagram with a listed structure from the specification already labelled. It would be beneficial for learners to consider this format for the heart anatomy.

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

Figure 1 shows blood flow through the right side of the heart.

1 (a) Identify the blood vessels labelled **A** and **B**.

(2) Q01a

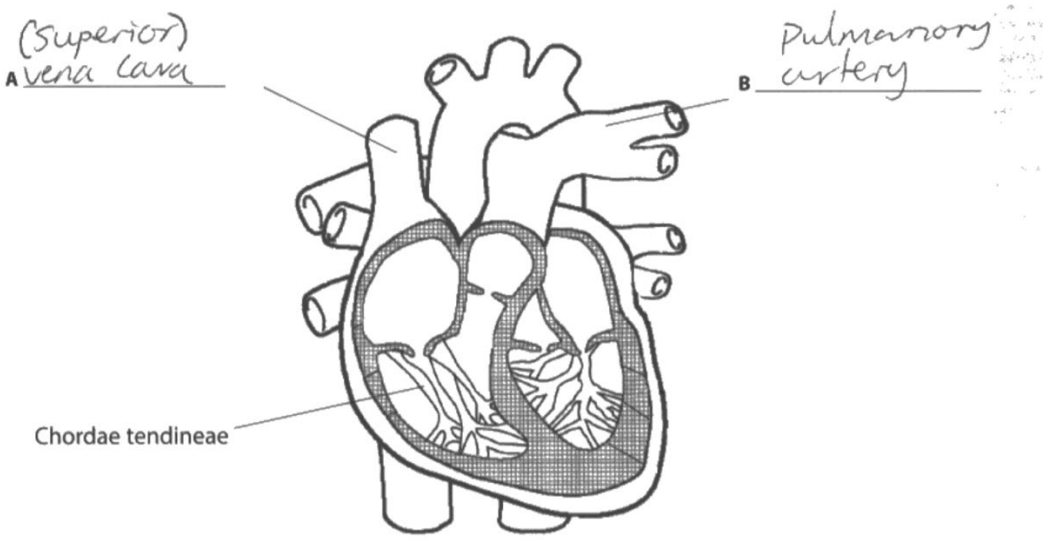
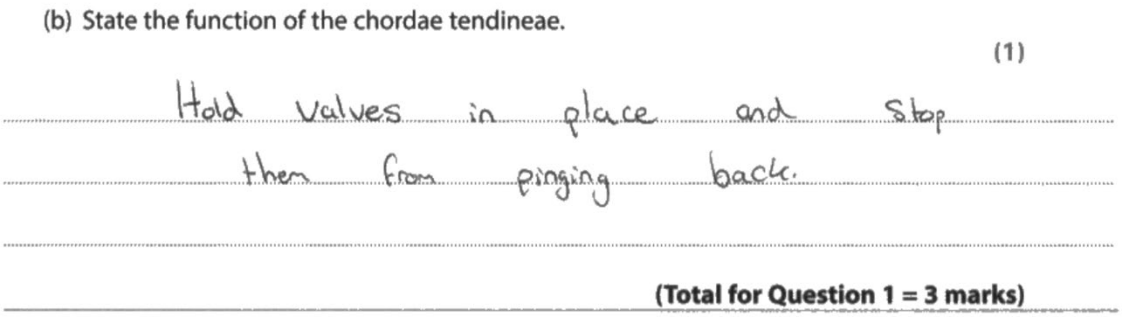


Figure 1

This response gained 2 marks
The blood vessels were accurately provided.

Q1b

The Chordae tendineae had not been assessed before. This component of the heart was labelled in the diagram and learners needed to state the function.


(b) State the function of the chordae tendineae.

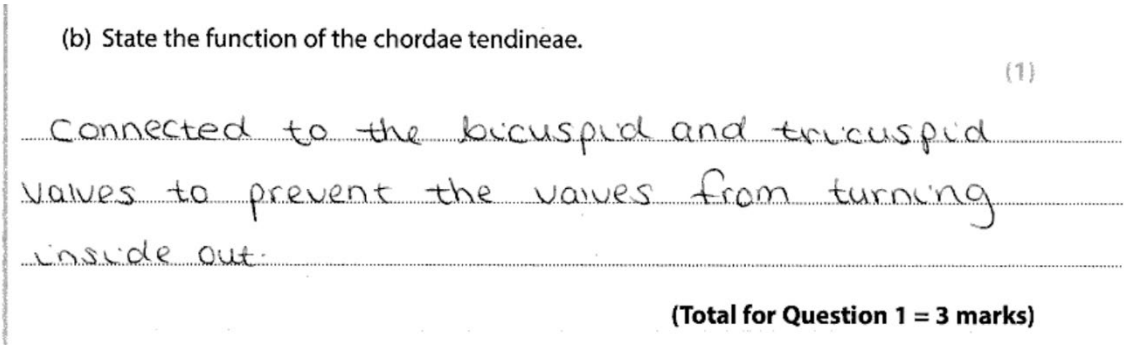
(1)

Hold valves in place and stop them from pinging back.

(Total for Question 1 = 3 marks)

This response gained 1 mark

The function is clearly stated and linked to the valves and holding them in place. It was important the learners linked correctly to the valves and not the chambers of the heart. It was common for learners to name the atrioventricular valves.


(b) State the function of the chordae tendineae.

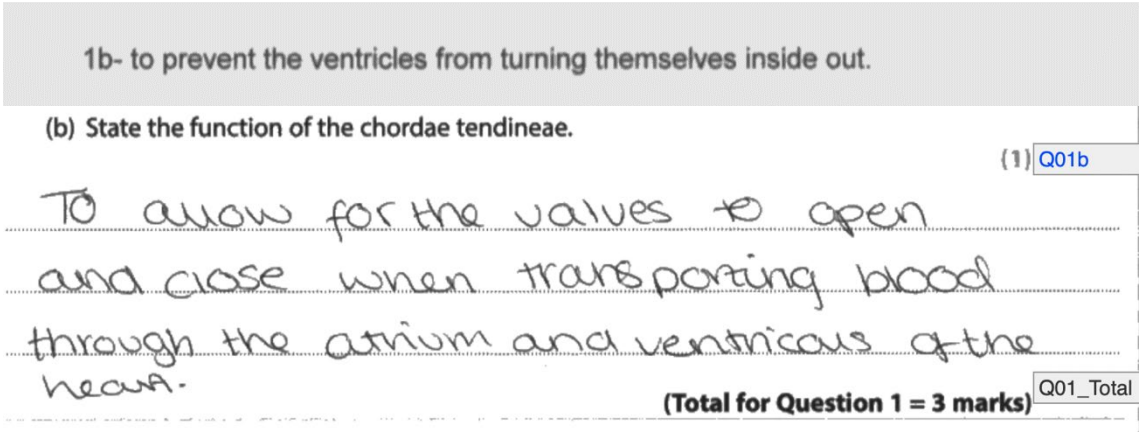
(1)

Connected to the bicuspid and tricuspid valves to prevent the valves from turning inside out.

(Total for Question 1 = 3 marks)

This response also gained 1 mark

This was an alternative way to gain 1 mark and was a common approach amongst learners. The learner has correctly linked to the correct valves in the heart and stated the function about preventing 'them to turn inside out'.



1b- to prevent the ventricles from turning themselves inside out.

(b) State the function of the chordae tendineae.

(1) Q01b

To allow for the valves to open and close when transporting blood through the atrium and ventricals of the heart.

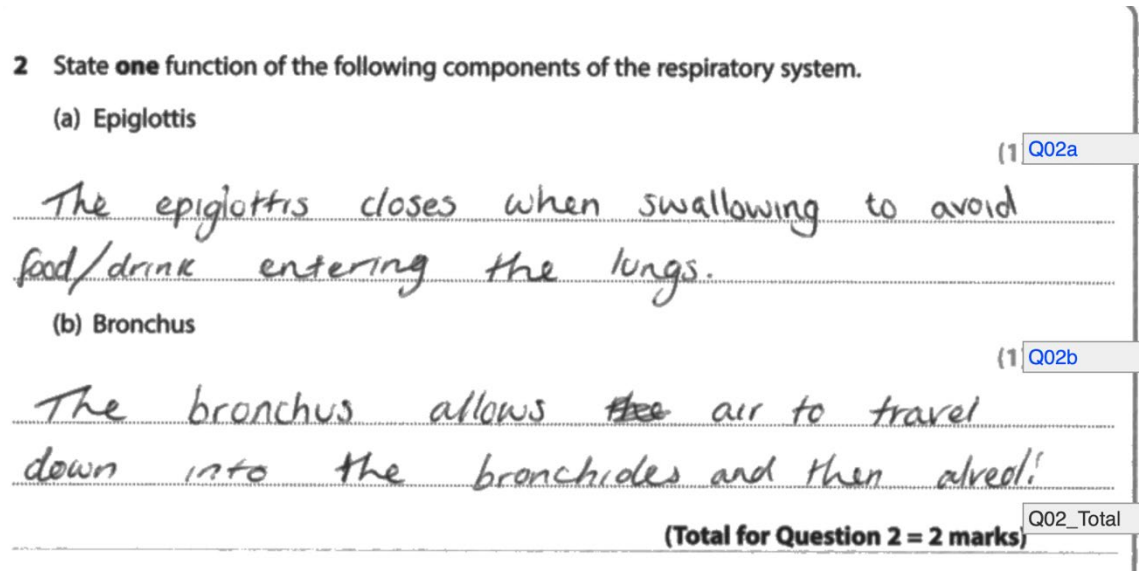
(Total for Question 1 = 3 marks) Q01_Total

Both responses gained 0 marks

They are both evidence of the common mistakes made on this question. The first response demonstrates a link to the ventricles and <u>not</u> the valves. The second one was seen frequently and would state the function of chordae tendineae as allowing blood flow through the heart or to prevent backflow into the atrium. Both of which were incorrect for credit.

Q2(a) and (b)

The responses to the two parts of the respiratory system were overall clear, demonstrating accurate understanding.



2 State **one** function of the following components of the respiratory system.

(a) Epiglottis

(1) Q02a

The epiglottis closes when swallowing to avoid food/drink entering the lungs.

(b) Bronchus

(1) Q02b

The bronchus allows ~~the~~ air to travel down into the bronchioles and then alveoli.

(Total for Question 2 = 2 marks) Q02_Total

This response gained 2 marks

The function is clear for both components as per the mark scheme.

2 State **one** function of the following components of the respiratory system.

(a) Epiglottis

(1)

controls what enters the trachea

(b) Bronchus

(1)

the tube that splits of into the left & right bronchi

(Total for Question 2 = 2 marks)

This response gained 1 mark

The function of the epiglottis was accurate for 2a. The response in 2b was a common mistake seen. The learners would provide detail on where the bronchus is located in the respiratory system, as seen here, rather than stating the function of 'directing air from the trachea to the bronchiole'.

Q3a

A similar diagram of a relaxed sarcomere had been seen on previous assessment material. In this series, learners were expected to use their knowledge of the sliding filament theory to identify Myosin and the Z line.

Figure 2 shows a muscle sarcomere at rest.

3 (a) Identify the parts of the sarcomere labelled **A** and **B** in **Figure 2**.

(2)

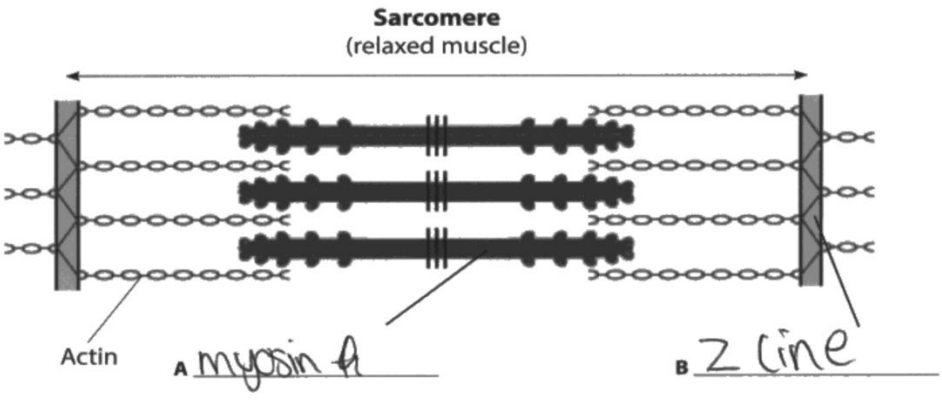


Figure 2

This response gained 2 marks

Both parts of the sarcomere are identified correctly.

Q3b

The command verb for this question is 'describe'. Consequently, to gain full marks, learners should provide a logical description of the role of **troponin** during muscle contraction / the sliding filament theory.

This question was designed to stretch and challenge learners to apply their knowledge and understanding of this part of the unit content, as it has been assessed in various forms in previous exam series. There were a minority of excellent answers, assisted by a previous question as an 8-mark extended question. However, on occasions the question was completely left unanswered or contained a full description of the sliding filament theory, rather than the specific role troponin plays in this theory.

(b) Describe the role of troponin in the sarcomere during muscle contraction.

(3) Q03b

~~to~~ calcium binds to troponin. This causes a change in shape in the tropomyosin and therefore exposes binding sites for the actin (thin) and myosin (thick) filaments to attach to enable muscle contraction.

Q03_Total

(Total for Question 3 = 5 marks)

This response gained 3 marks

This response is evidence of learners scoring full marks as they would accurately describe calcium (1) being released during muscle contraction and attaching to the troponin, so that the shape or the tropomyosin would be changed (1) to expose a binding site (1) for the myosin.

(b) Describe the role of troponin in the sarcomere during muscle contraction.

(3)

During a muscle contraction, ~~when~~ an action potential is identified, ~~act~~ and is sent to a neuromuscular Junction from the axon, ~~&~~ actin is released ^ from the sarcomere which binds with myosin ^ forming a cross bridge. Troponin turns into tropomyosin and ATP and ADP bonds but ATPase Separates them which ~~to~~ causes the muscle to Contract.

(Total for Question 3 = 5 marks)

This response gained 0 marks

This is evidence of learners describing their knowledge of the sliding filament theory. It was common to see responses about actin and myosin binding to form a crossbridge. Both of which would happen after troponin has carried out its' role. Troponin is referenced in this response; however, it is inaccurate knowledge and does not align with the mark scheme.

Q4a and b

This question was a highly accessible question and assessed learners' knowledge and understanding of the location and function of bones, specifically flat bones. Leaners achieved well in this question.

4 (a) Name **two** examples of a flat bone.

(2)

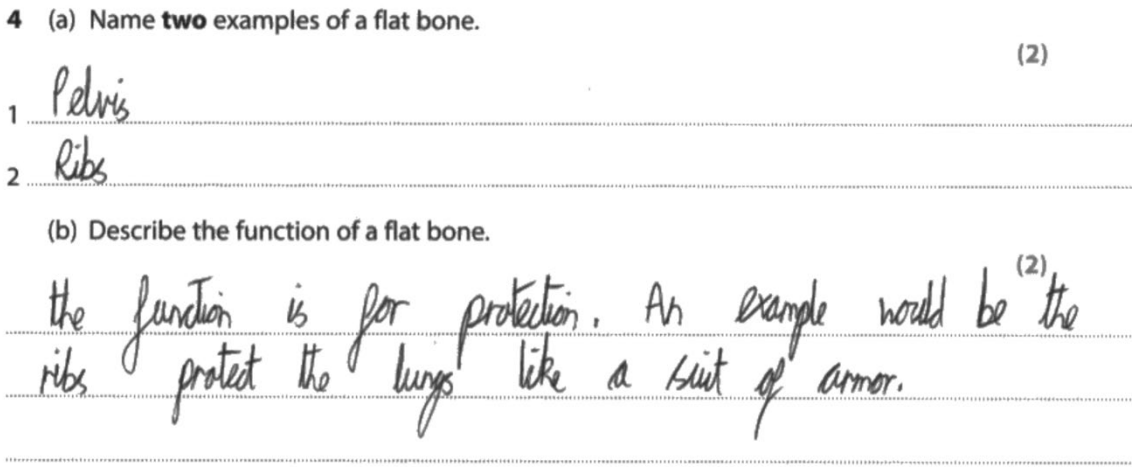
1 ~~Scaptl~~ Scapula

2 Sternum

(b) Describe the function of a flat bone.

(2)

~~Attach~~ Has a wide surface area. This is useful for muscles to attach to to create movement.



4 (a) Name **two** examples of a flat bone.

(2)

1 Pelvis

2 Ribs

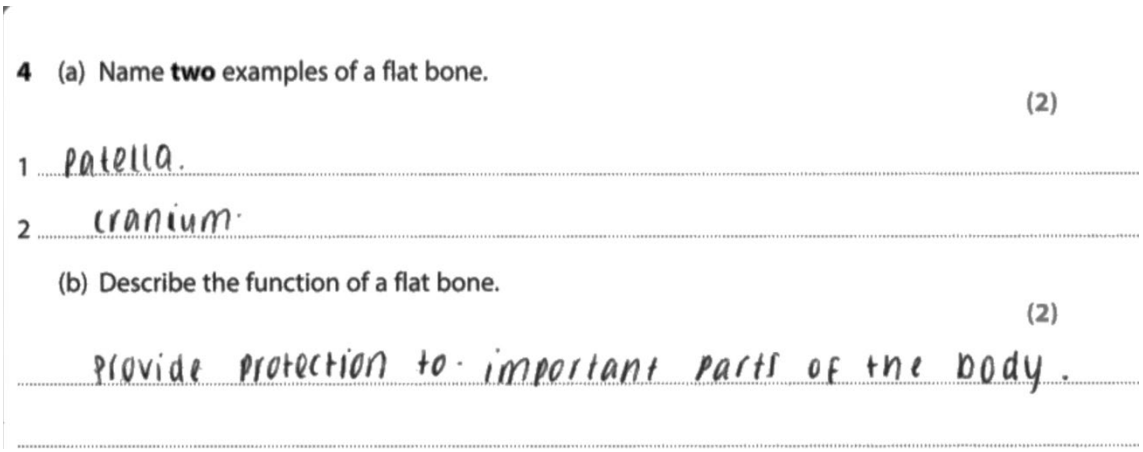
(b) Describe the function of a flat bone.

(2)

the function is for protection. An example would be the ribs protect the lungs like a suit of armor.

Both responses gained full marks (2 and 2)

These responses show the examples of the correct bones named in 4a. The responses to 4b are evidence of the alternatives on the mark scheme as an accurate description of the function of a flat bone. On the second response, it shows how learners would often state the function of 'protection' and provide a link descriptive statement using an example of a bone and the name of the organs it is protecting. In this instance, "the ribs protect the lungs". There were many variations of this approach



4 (a) Name **two** examples of a flat bone.

(2)

1 patella.

2 cranium.

(b) Describe the function of a flat bone.

(2)

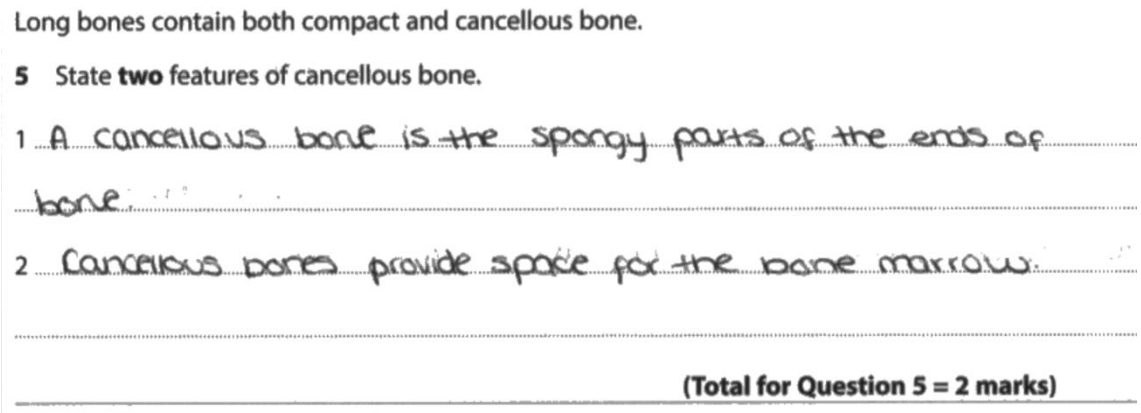
provide protection to important parts of the body.

This response gained 2 marks overall (4a – 1 and 4b – 1)

The cranium was credited as per the mark scheme. Occasionally, learners would name the 'patella'. This is a sesamoid bone. For part 4b, protection has identified, however 'what' is being protected in omitted and would be required for the 2nd mark.

Q5

Like 1b, this question was from an area of the specification content yet to be assessed. It was an accessible question and assessed learners' knowledge of the features of cancellous bone. There was a variation of features learners could have stated, as captured in the mark scheme.



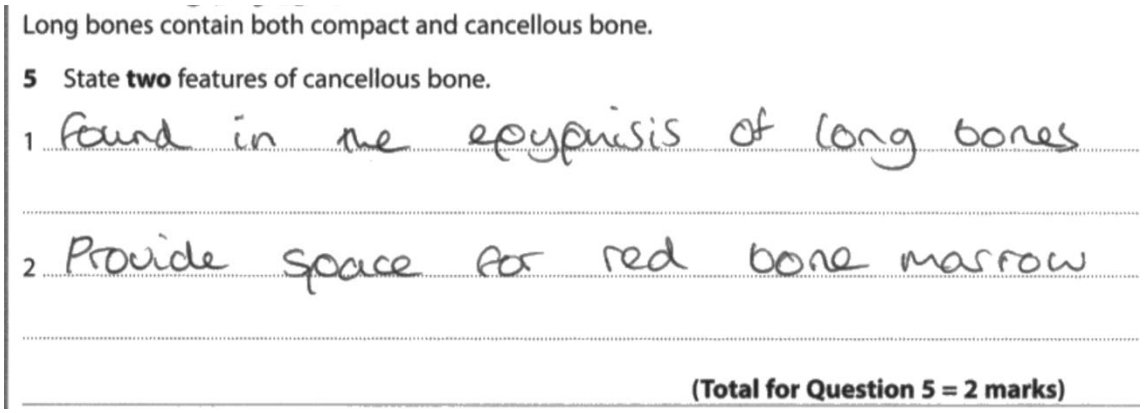
Long bones contain both compact and cancellous bone.

5 State **two** features of cancellous bone.

1 A cancellous bone is the spongy parts of the ends of bone.

2 Cancellous bones provide space for the bone marrow.

(Total for Question 5 = 2 marks)



Long bones contain both compact and cancellous bone.

5 State **two** features of cancellous bone.

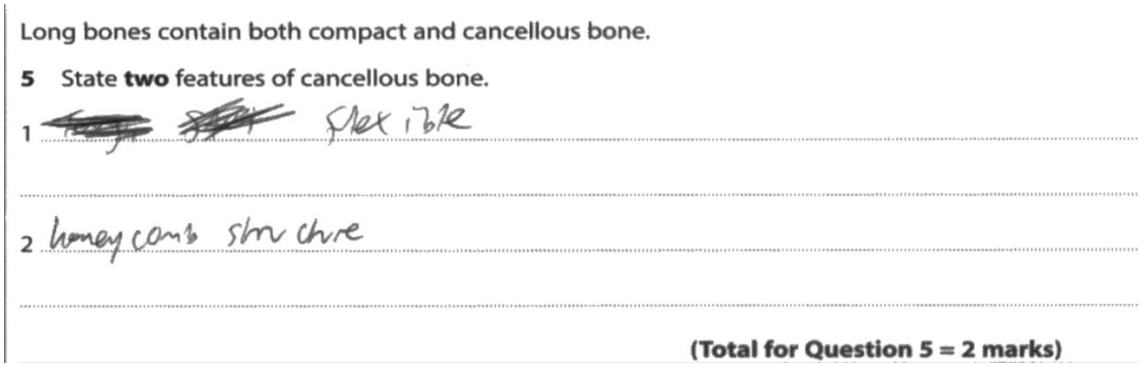
1 found in the epiphisis of long bones

2 Provide space for red bone marrow

(Total for Question 5 = 2 marks)

Both responses gained 2 marks

The responses show how marks could be achieved from the array of points available on the mark scheme.


Long bones contain both compact and cancellous bone.

5 State **two** features of cancellous bone.

1 [illegible] flex ible

2 honeycomb struc ture

(Total for Question 5 = 2 marks)

This response gained 1 mark

The learner accurately stated 'honeycomb' appearance to gain 1 mark.
It was common to see learners stating flexible, hard, soft, or linking cancellous bone with bone growth, all of which did not gain credit

Q6

This question showed an image of an athlete starting in a standing position and moving **downwards** into a squat position. Leaners were asked to specifically explain the type of muscle contraction occurring in the **quadriceps** during this movement.

A high proportion of learners would not explain eccentric muscle contraction but would opt for an analysis about what was occurring at the knee joint to be able to achieve the squat position.

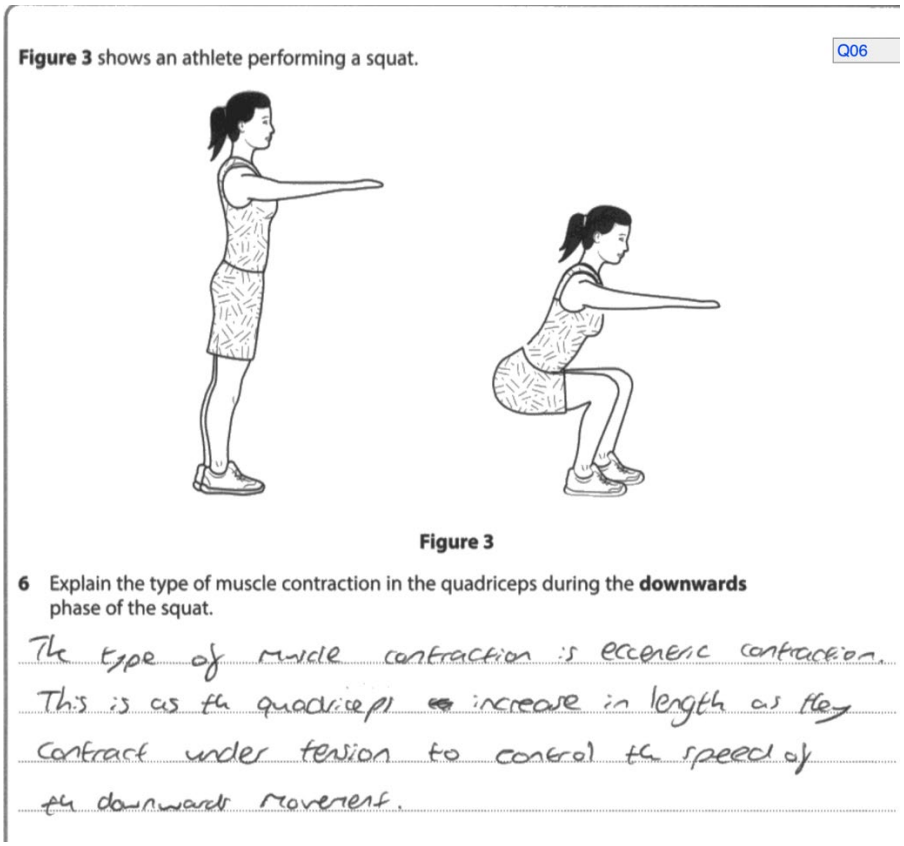


Figure 3 shows an athlete performing a squat.

Q06

Figure 3

6 Explain the type of muscle contraction in the quadriceps during the **downwards** phase of the squat.

The type of muscle contraction is eccentric contraction. This is as the quadriceps increase in length as they contract under tension to control the speed of the downward movement.

This response gained 4 marks

The learner correctly identified 'eccentric' muscle contraction, followed by linked explanation points of the quadriceps increasing in length, under tension to be able to control the movement.

6 Explain the type of muscle contraction in the quadriceps during the **downwards** phase of the squat.

The downward phase would be ~~concentric~~ Eccentric contraction, since when she is bending down, the quadriceps are lengthening.

This response gained 2 marks

The learner correctly identified 'eccentric' (1) muscle contraction, followed but one explanation point of the quadriceps lengthening (1).

6 Explain the type of muscle contraction in the quadriceps during the **downwards** phase of the squat.

The athlete is doing knee flexion within the downwards phase of the Squat. This requires the quadriceps, which are the agonists, and hamstrings, which are the antagonists. This means the quads are getting shorter and contracting whilst the hamstrings are getting longer.

(Total for Question 6 = 4 marks)

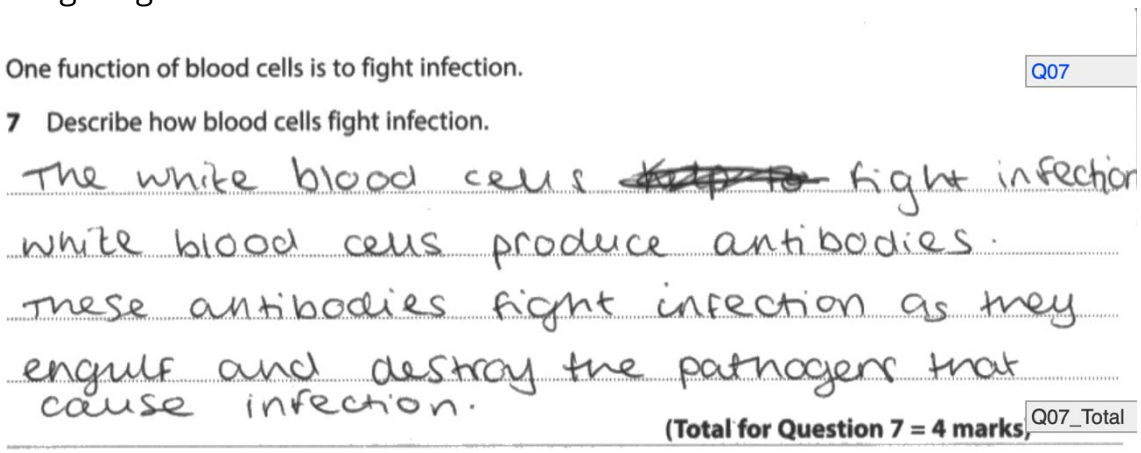
This response gained 1 mark.

This response is very typical of learners using their preparation and application for the last 2 questions of the paper and answering the question with knowledge on knee flexion. In many cases, there were 0 marks awarded. This response however, achieved 1 mark for accurately stating the quadriceps as the 'agonist' as this was a linked point available in the mark scheme.

Q7

The command verb for this question was also 'describe'. Consequently, to gain full marks, learners should provide a logical description of how blood cells can fight infection.

Most learners would identify white blood cells and describe how they fight infection. Occasionally, learners would describe platelets which was not credited as the scabbing process involved not letting infection in as opposed to fighting it.


One function of blood cells is to fight infection. Q07

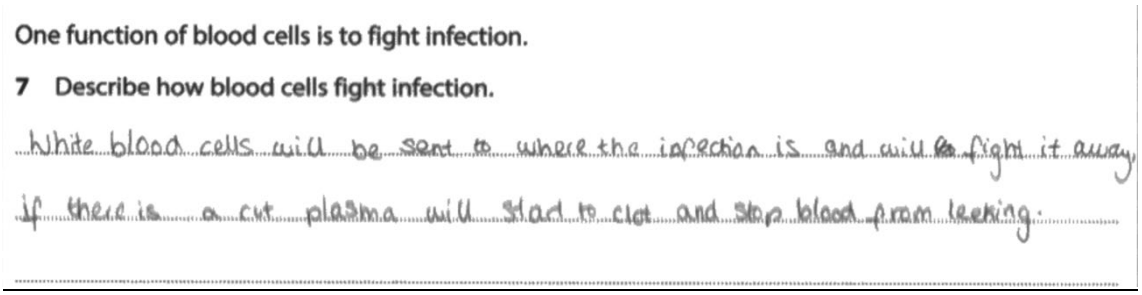
7 Describe how blood cells fight infection.

The white blood cells ~~[illegible]~~ fight infection white blood cells produce antibodies. these antibodies fight infection as they engulf and destroy the pathogens that cause infection.

(Total for Question 7 = 4 marks) Q07_Total

This response gained 4 marks

The learner correctly identified 'white blood cells', followed by linked descriptive points as per the mark scheme.


One function of blood cells is to fight infection.

7 Describe how blood cells fight infection.

White blood cells will be sent to where the infection is and will fight it away if there is a cut plasma will start to clot and stop blood from leaking.

This response gained 2 marks

The learner identifies white blood cells (1) and shows knowledge that they travel to the site of the infection (1). There are no other descriptive points. The remaining part of the response is incorrect for plasma; however, it was common to see responses like this for platelets which was not creditworthy.

Q8

This was an accessible question about lung volumes. It used a table format with an example already provided for Vital capacity.

8 Identify the lung volumes from the descriptions in **Table 1**.
An example has been given.

Description	Lung volume
The maximum amount of air that can be breathed in and out in one breath	Vital capacity
The amount of air breathed in or out per breath	1 tidal volume
The amount of air left in the lungs after maximum expiration	2 residual volume

Table 1

(Total for Question 8 = 2 marks)

This response gained 2 marks

The lung volumes were accurately identified.

8 Identify the lung volumes from the descriptions in **Table 1**.
An example has been given.

Description	Lung volume
The maximum amount of air that can be breathed in and out in one breath	Vital capacity
The amount of air breathed in or out per breath	1 tidal volume
The amount of air left in the lungs after maximum expiration	2 Expiratory reserve volume

Table 1

(Total for Question 8 = 2 marks)

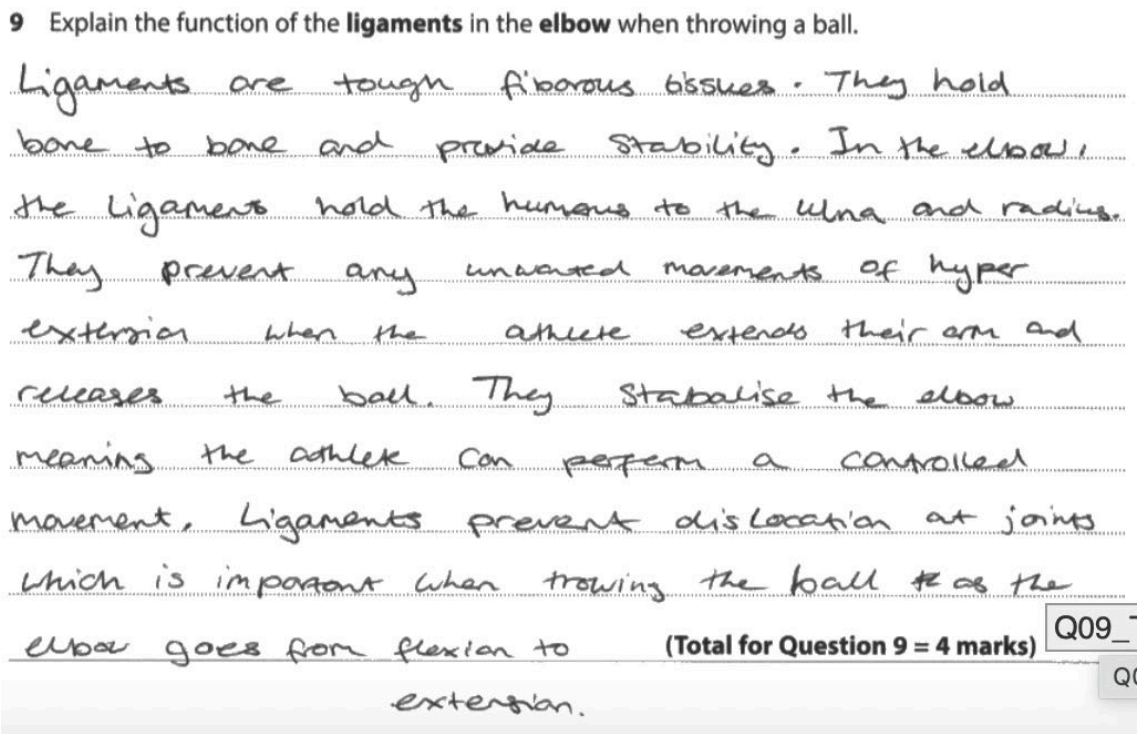
This response gained 1 mark

Tidal volume was accurately identified. Occasionally learners would identify Expiratory reserve volume instead of residual volume.

Q9

This question showed an image of an athlete about the throw a ball. Leaners were asked to specifically explain the function of the ligaments at the elbow when throwing a ball.

Like question 6, a high proportion of learners would not explain about joint stability and the ligaments playing a key role in preventing unwanted movement but would opt for an analysis about what was occurring at the elbow joint to be able to throw a ball.



9 Explain the function of the **ligaments** in the **elbow** when throwing a ball.

Ligaments are tough fibrous tissues. They hold bone to bone and provide stability. In the elbow, the ligaments hold the humerus to the ulna and radius. They prevent any unwanted movements of hyper extension when the athlete extends their arm and releases the ball. They stabalise the elbow meaning the athlete can perform a controlled movement. Ligaments prevent dislocation at joints which is important when trowing the ball as the elbow goes from flexion to extension.

(Total for Question 9 = 4 marks)

Q09_

This response gained 4 marks

The learner correctly stated that the ligaments provide stability (1) in the joint, by connecting the two bones (bone to bone) (1), to prevent unwanted movement (1) such a dislocation (1).

Figure 4 shows an athlete throwing a ball.

Source: © filo/Getty Images

Figure 4

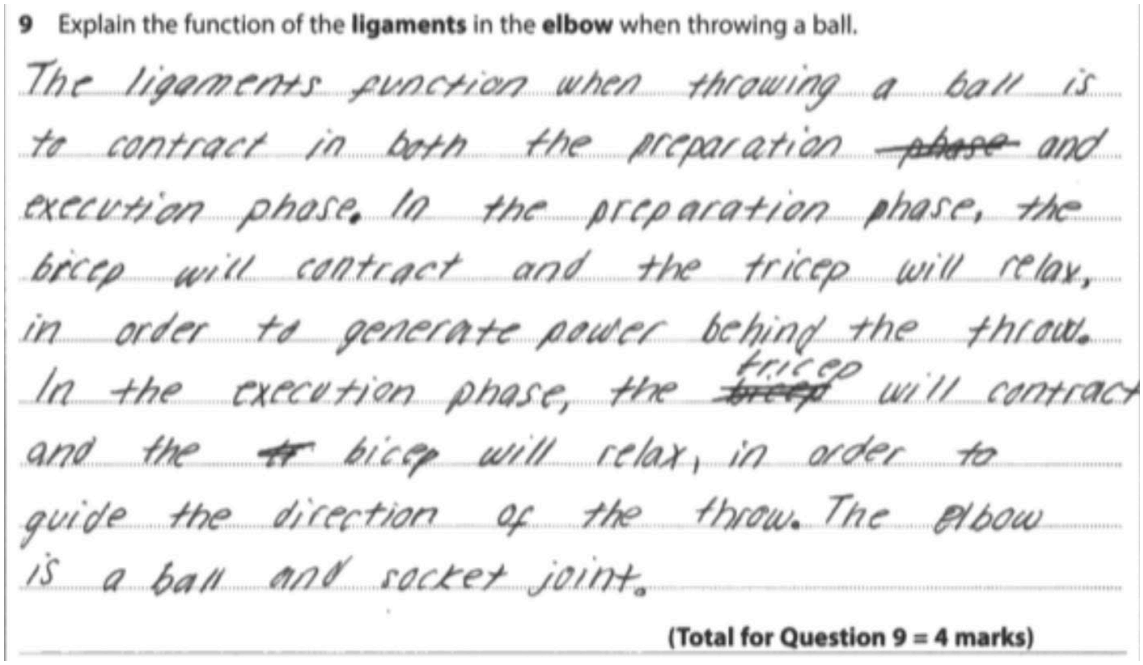
9 Explain the function of the **ligaments** in the **elbow** when throwing a ball.

The ligaments in the elbow help control the joint when doing movements such as flexion and extension in the ~~arm~~ movement of throwing a ball. The ligaments prevent any ~~um~~ unwanted movement or twisting at the joint and prevents ~~o~~ ~~over~~ hyperextension of the elbow joint.

(Total for Question 9 = 4 marks)

This response gained 1 mark.

Prevent unwanted movement/hyperextension is evident for 1 mark.



9 Explain the function of the **ligaments** in the **elbow** when throwing a ball.

The ligaments function when throwing a ball is to contract in both the preparation ~~phase~~ and execution phase. In the preparation phase, the bicep will contract and the tricep will relax, in order to generate power behind the throw. In the execution phase, the ~~bicep~~ tricep will contract and the ~~it~~ bicep will relax, in order to guide the direction of the throw. The elbow is a ball and socket joint.

(Total for Question 9 = 4 marks)

This response gained 0 marks.

As previously alluded to in question 6, learners would also opt to answer question 9 with an analysis at the elbow to be able throw the ball. This is an example of that type of response seen.

Q10

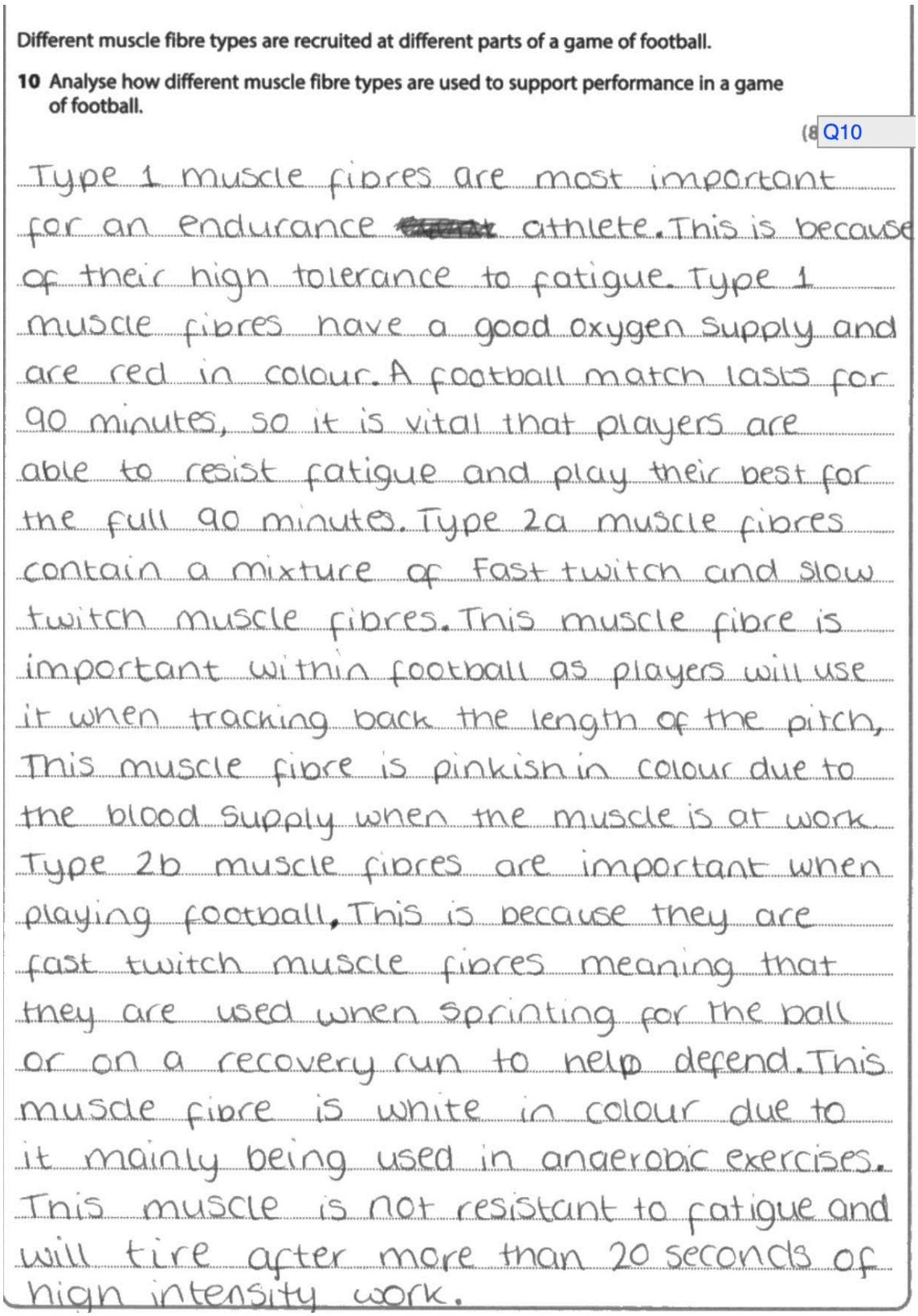
Responses to extended answer questions are marked using levels-based mark schemes, with the quality of the response determining the level. There are four levels; level 0 where there is no rewardable material presented and then levels 1, 2 and 3; the higher the level the better the quality of response.

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 performance in football.

The question asks learners to analyse different muscle fibre types.

There were some excellent answers, breaking down in accurate detail the <u>three</u> muscle fibre types as per the specification, with a relevant description and clear link to how the component supports performance in football. The link to football or breadth of analysis of each type is where differentiation between level 2 and level 3 responses occurred.

This was a typical level 3 response



Different muscle fibre types are recruited at different parts of a game of football.

10 Analyse how different muscle fibre types are used to support performance in a game of football.

(8) Q10

Type 1 muscle fibres are most important for an endurance athlete. This is because of their high tolerance to fatigue. Type 1 muscle fibres have a good oxygen supply and are red in colour. A football match lasts for 90 minutes, so it is vital that players are able to resist fatigue and play their best for the full 90 minutes. Type 2a muscle fibres contain a mixture of Fast twitch and slow twitch muscle fibres. This muscle fibre is important within football as players will use it when tracking back the length of the pitch, This muscle fibre is pinkish in colour due to the blood supply when the muscle is at work. Type 2b muscle fibres are important when playing football. This is because they are fast twitch muscle fibres meaning that they are used when sprinting for the ball or on a recovery run to help defend. This muscle fibre is white in colour due to it mainly being used in anaerobic exercises. This muscle is not resistant to fatigue and will tire after more than 20 seconds of high intensity work.

This response gained 8 marks

The learner has provided full analysis of each muscle fibre type: Type 1, Type IIa, and Type IIx. Each component was described which a clear link to how each supports performance in football.

Different muscle fibre types are recruited at different parts of a game of football.

10 Analyse how different muscle fibre types are used to support performance in a game of football.

(8)

So fast twitch muscle fibres are ~~used~~ are recruited in football for example when a Striker shoots the ball towards goal but it takes a deflection so therefore the keeper is ~~expection~~ expecting it to go ~~are~~ one way but because of the deflection it goes the other way so the ~~'s~~ keeper has to react fast to save the shot.

Slow ~~twitch~~ twitch muscle fibres are ~~used in~~ ~~fast~~ recruited in football when your team is in possession and the intensity of game is low and you're just passing ~~the~~ the ball to your teamates.

This response gained 3 marks

This response is an example of a level 1 response.
Learners would look at the difference between fast and slow twitch fibres.

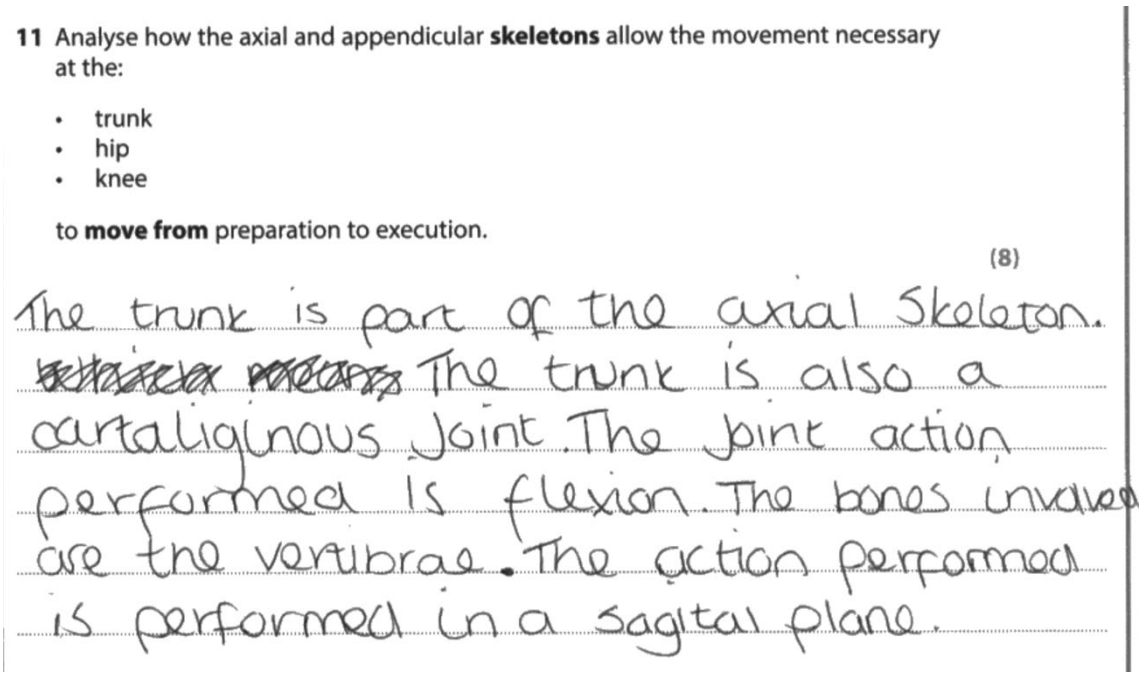
In this response the learner has shown isolated knowledge of fast twitch fibres, and despite not identifying Type IIa or IIx, it accurately links the nature of fast twitch fibres to accurate examples in football. Slow twitch fibres are identified and linked correctly to low intensity.

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 pike jump.

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.



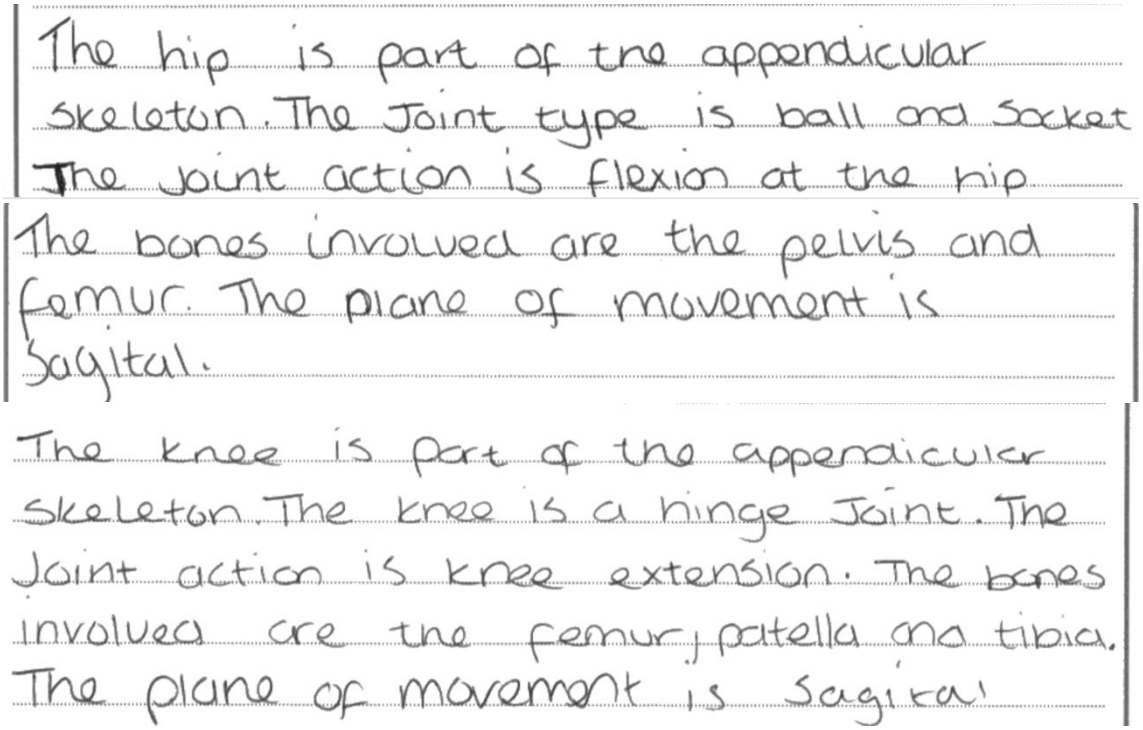
11 Analyse how the axial and appendicular **skeletons** allow the movement necessary at the:

- trunk
- hip
- knee

to **move from** preparation to execution.

(8)

The trunk is part of the axial Skeleton. ~~The trunk~~ The trunk is also a cartaliginous joint. The joint action performed is flexion. The bones involved are the vertebrae. The action performed is performed in a sagital plane.


The hip is part of the appendicular skeleton. The joint type is ball and socket The joint action is flexion at the hip

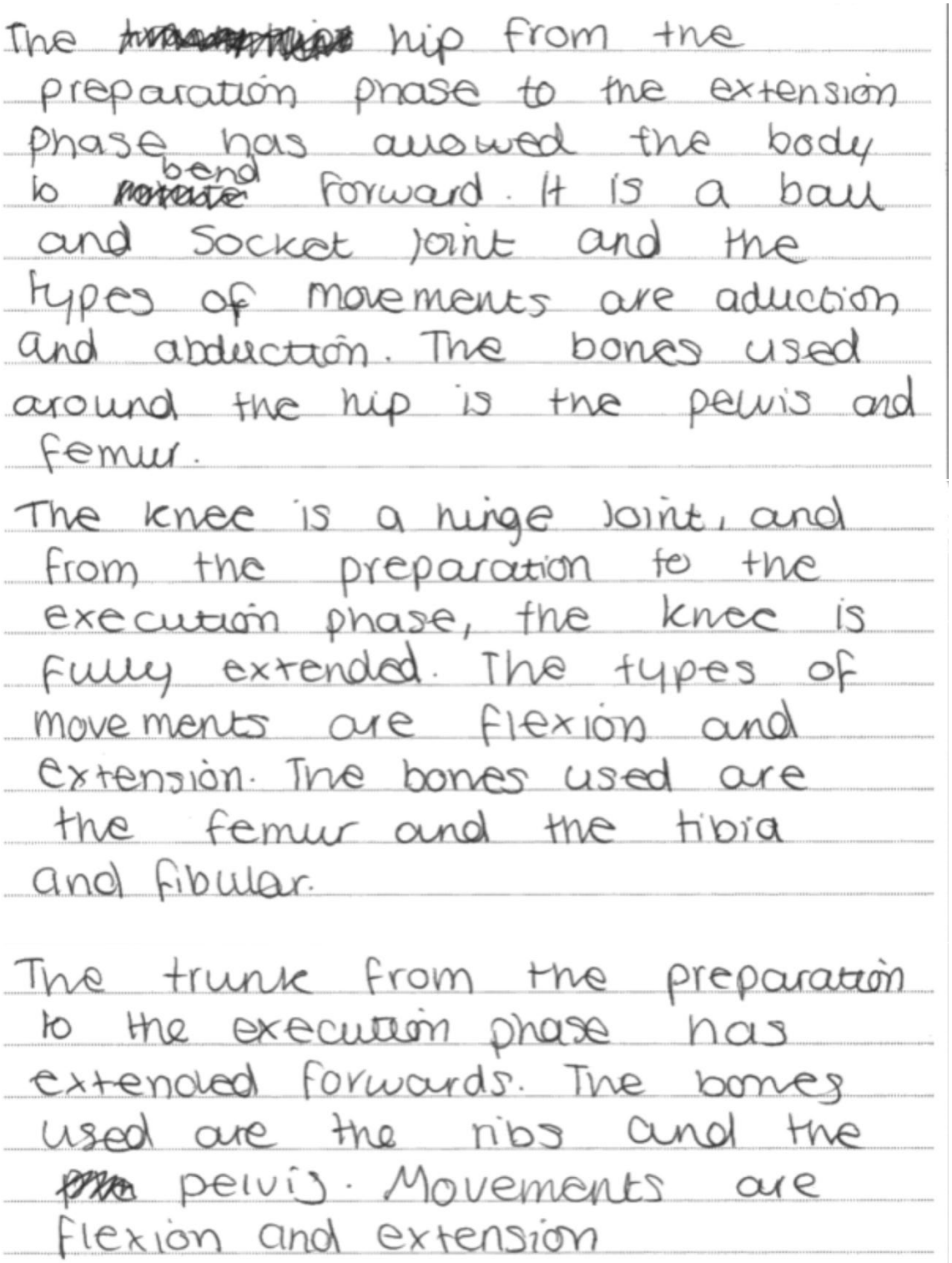
The bones involved are the pelvis and femur. The plane of movement is sagital.

The knee is part of the appendicular skeleton. The knee is a hinge joint. The joint action is knee extension. The bones involved are the femur, patella and tibia. The plane of movement is sagital

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 **flexion** 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 analysing joints within sporting movements.


The [illegible] hip from the preparation phase to the extension phase has allowed the body to [illegible] bend forward. It is a ball and socket joint and the types of movements are adduction and abduction. The bones used around the hip is the pelvis and femur.

The knee is a hinge joint, and from the preparation to the execution phase, the knee is fully extended. The types of movements are flexion and extension. The bones used are the femur and the tibia and fibular.

The trunk from the preparation to the execution phase has extended forwards. The bones used are the ribs and the [illegible] pelvis. Movements are flexion and extension

This response gained 4 marks

There is isolated knowledge and the correct joint and bones for the hip and knee are evident. The learner has also accurately identified the extension of the knee. This is typical of partial analysis for level 2.

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 blocking the ball in volleyball.

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 elbow. 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 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 block from preparation to execution and achieved marks in the level 3 grade descriptor.

Figure 6

12 Analyse the required movement at the:

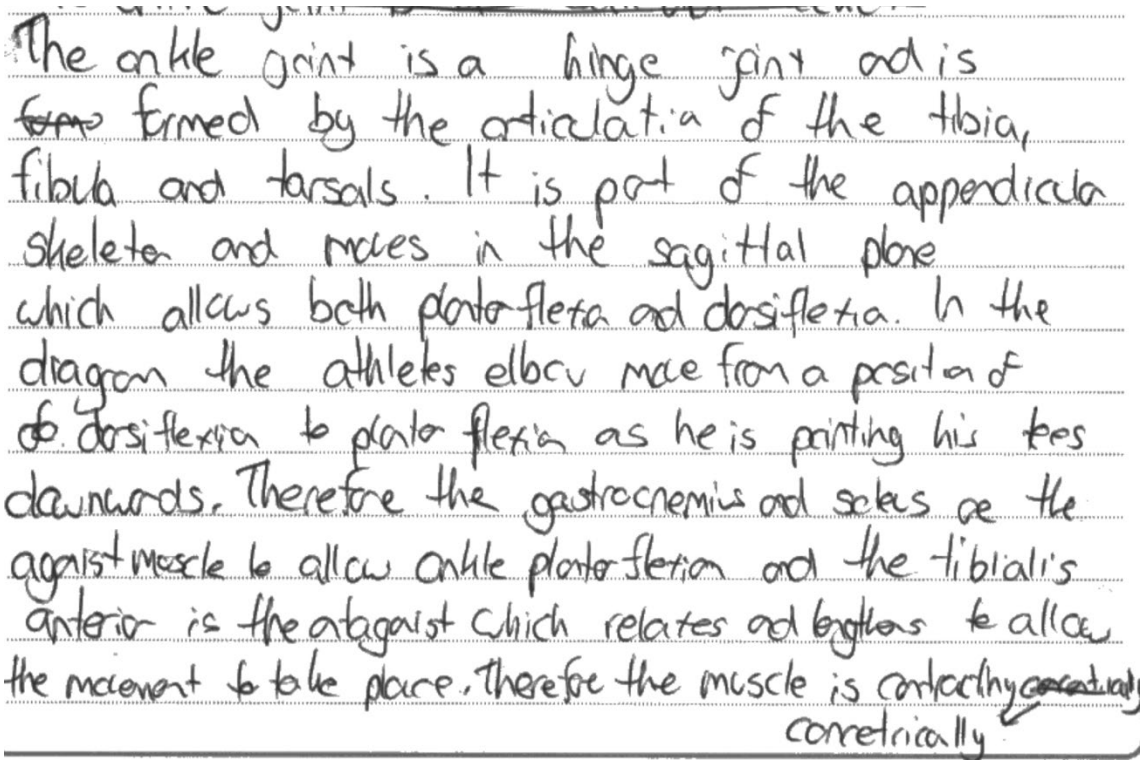
- elbow
- shoulder
- ankle

for the athlete to **move from** preparation to execution.

(14 Q12

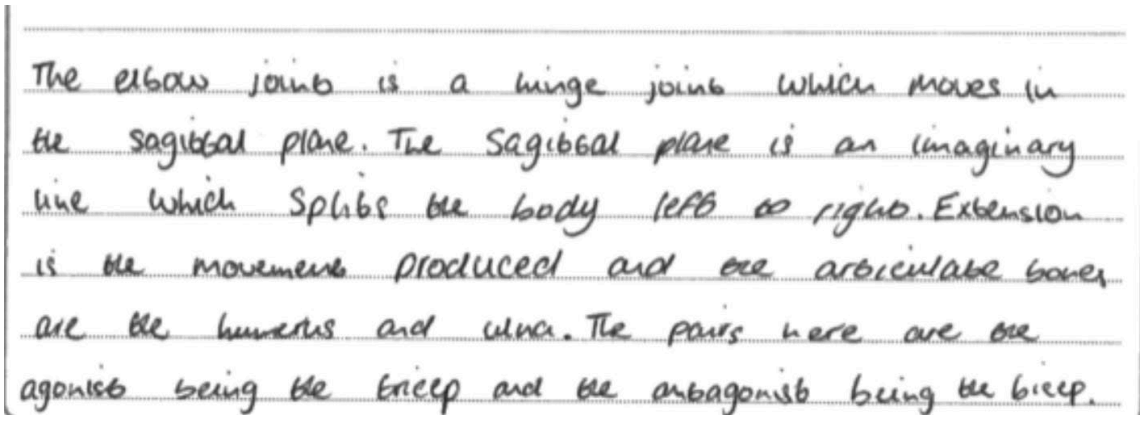
The elbow joint is a hinge joint and is formed by the articulation of the humerus, radius and ulna. It is part of the appendicular skeleton and moves in the sagittal plane which allows both flexion and extension. In the diagram the athletes elbow moves from a position of flexion to extension. Therefore the tricep brachii are the agonist muscle to allow elbow extension and the bicep brachii are the antagonist which relaxes to allow the movement to take place as a result the muscle is contracting concentrically.

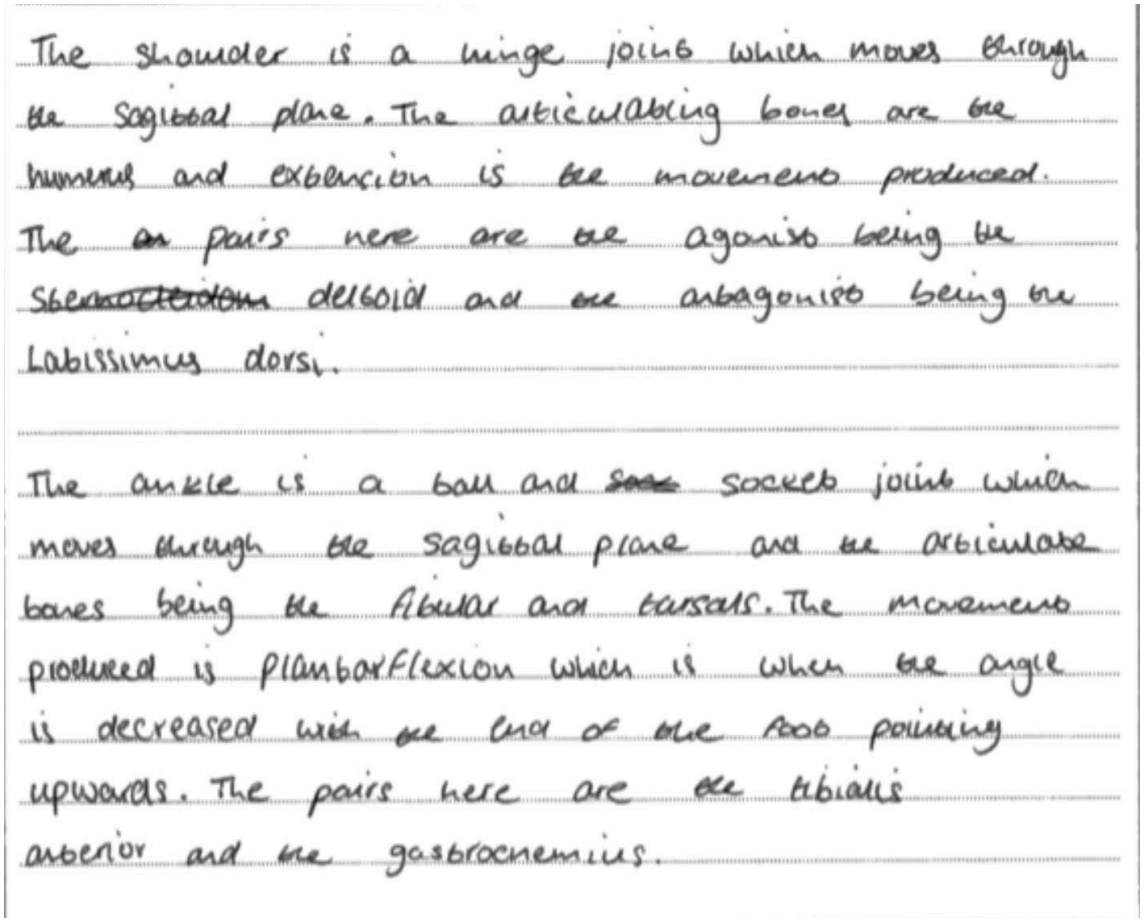
The shoulder joint is a ball and socket joint and is formed through the articulation of the humerus, clavicle and scapula. It is part of the appendicular skeleton and moves in the sagittal plane which likewise allows both flexion and extension. In the diagram the athletes shoulder move from a position of extension to flexion. Therefore the anterior deltoid are the agonist muscle to allow shoulder flexion and the posterior deltoid are the antagonist muscle which relaxes and lengthens to allow the movement to take place. As a result the muscle is contracting concentrically.


The ankle joint is a hinge joint and is formed by the articulation of the tibia, fibula and tarsals. It is part of the appendicular skeleton and moves in the sagittal plane which allows both plantarflexion and dorsiflexion. In the diagram the athletes elbow move from a position of dorsiflexion to plantar flexion as he is pointing his toes downwards. Therefore the gastrocnemius and soleus are the agonist muscle to allow ankle plantarflexion and the tibialis anterior is the antagonist which relates and lengthens to allow the movement to take place. Therefore the muscle is contracting concentrically

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 volleyball player. Therefore, it receives a mark which represents a level 3 grade descriptor.


The elbow joint is a hinge joint which moves in the sagittal plane. The sagittal plane is an imaginary line which splits the body left to right. Extension is the movement produced and the articulate bones are the humerus and ulna. The pairs here are the agonist being the tricep and the antagonist being the bicep.



The shoulder is a hinge joint which moves through the sagittal plane. The articulating bones are the humerus and extension is the movement produced. The ~~an~~ pairs here are the agonist being the ~~shoulder~~ deltoid and the antagonist being the latissimus dorsi.

The ankle is a ball and ~~sock~~ socket joint which moves through the sagittal plane and the articulate bones being the fibular and tarsals. The movement produced is plantarflexion which is when the angle is decreased with the end of the foot pointing upwards. The pairs here are the tibialis anterior and the gastrocnemius.

This response gained 8 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, plane, agonist, and antagonist muscle.
Shoulder: partial analysis including plane of movement and correct agonist and antagonist muscle.
Ankle: likewise, the learner has completed a partial analysis including the plane, movement, and identification of muscles involved at the ankle.

Centres need to be aware that both bones at the joint are required for credit.

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.
- In questions 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 both bones at the joint, the correct agonist and antagonist muscle, in the correct order to create the movement required at the joint.
- For questions 1-10 it is highly unlikely learners will be expected to analyse in the way they do for question 11 and 12. If movements are used in the question, it is to provide context for the functional anatomy occurring.
- Assessment materials (SAMs) located on the BTEC National qualification webpage located here.