L3 Lead Examiner Report 1901

January 2019

L3 Qualification in Sport and Exercise Science

Unit 2: Functional Anatomy (31814H)

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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

31814H – Unit 2: Functional Anatomy (31814H)

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	0	10	21	33	45

Introduction

This is the second series of external examinations with regards to the new specification. The method of assessment was via examination as opposed to centre based internal assessment as employed within the old specification.

Centres and learners should be acknowledged for their preparation. There were some changes to the assessment format from the first series. 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, in order 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 gained; 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. There were some changes to these questions with an overall reduction of ten marks. Questions 10 and 11 were reduced from ten marks each in the previous series to eight marks each this time. While Question 12 was reduced from twenty marks in the previous series to 14 marks this time.

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.

Q1

This was an accessible question with the vast majority of learners achieving at least two marks for identifying two different types of bone.

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

Table 1 shows a type of bone and an example of that type of bone.

1 Complete the table by:

- stating **two other** types of bone
- giving an example of each type of bone.

Type of bone	Example
Sesamoid	Patella
Long	Femur
Flat	Cranium

Table 1

(Total for Question 1 = 4 marks)

This response gained 4 marks

Two types of bone were stated with an accurate example of each type.

A common error amongst many learners was when they stated 'short bone' they gave an example of 'Phalanges' when in fact these bones are an example of a long bone.

Q2(a)

This question had an array of responses. For some learners there was confusion of the pulmonary vein with the pulmonary artery and learners would answer stating that the pulmonary vein carries deoxygenated blood which is inaccurate and / or would state it carries blood back to the lungs, also inaccurate.

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

(a) Pulmonary vein

(1)

carry oxygenated blood from the lungs back to the left atrium of the heart.

This response gained 1 mark

One mark gained for correctly stating the type of blood carried and where to; lungs to the heart.

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

(a) Pulmonary vein

(1)

deoxygenated carries blood out of the heart to the lungs.

This response gained 0 marks.

It is typical of the confusion with the pulmonary artery, as explained above.

Q2(b)

The responses for this had a much more consistent approach than 2a. A high proportion of learners were able to state that the aorta takes blood from the heart to the rest of the body. This is shown in this response

(b) Aorta

(1)

Take oxygenated blood to the rest of the body from the heart.

(Total for Question 2 = 2 marks)

This response gained 1 mark

Q3

This question was the first time Sliding Filament Theory had appeared in live assessment material. Using an image of a relaxed sarcomere with Myosin already labelled was accessible to learners, however many learners were confused by the two other labels, although clearly more confident with the other protein; Actin. A variety of responses from other areas of the specification were seen for label B.

Figure 1 shows a sarcomere at rest.

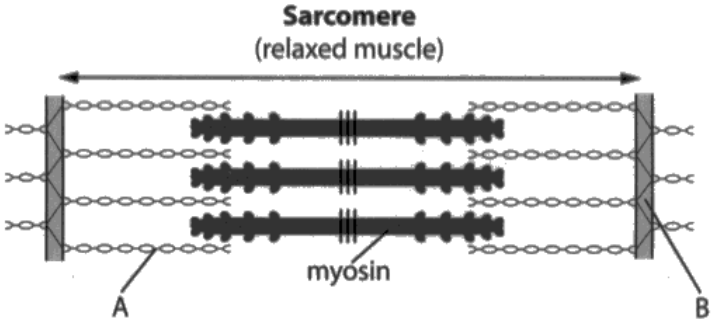


Figure 1

3 Identify **A** and **B** shown in **Figure 1**.

A Actin

B Z - line

(Total for Question 3 = 2 marks)

This response gained 2 marks

The learner has correctly identified Actin and the Z line in the relaxed sarcomere.

Figure 1 shows a sarcomere at rest.

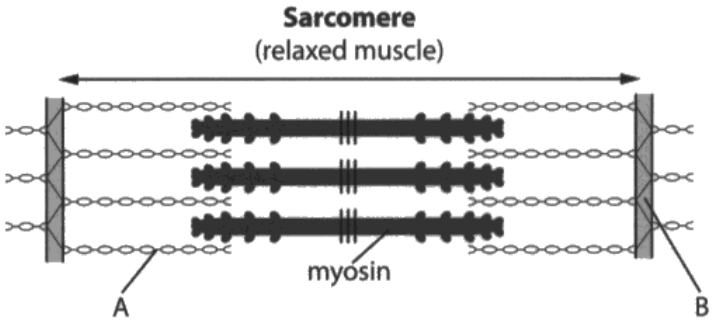


Figure 1

3 Identify **A** and **B** shown in **Figure 1**.

A Tropomyosin

B Z line (end of sarcomere)

(Total for Question 3 = 2 marks)

This response also gained 2 marks

The learner has correctly identified Tropomyosin and the Z line in the relaxed sarcomere. Identifying Troponin and Tropmyosin demonstrated good knowledge of how these could be in the area when A is labelled.

Q4

This question was very accessible to learners. The vast majority achieved two marks for correctly identifying the function of the blood plasma; transportation. Many would not use this term but would give a suitable alternative such as 'carry', 'moves through', 'travelling' and 'flowing' to name a few. Learners were then able to gain a second mark for a what the plasma was transporting around the body.

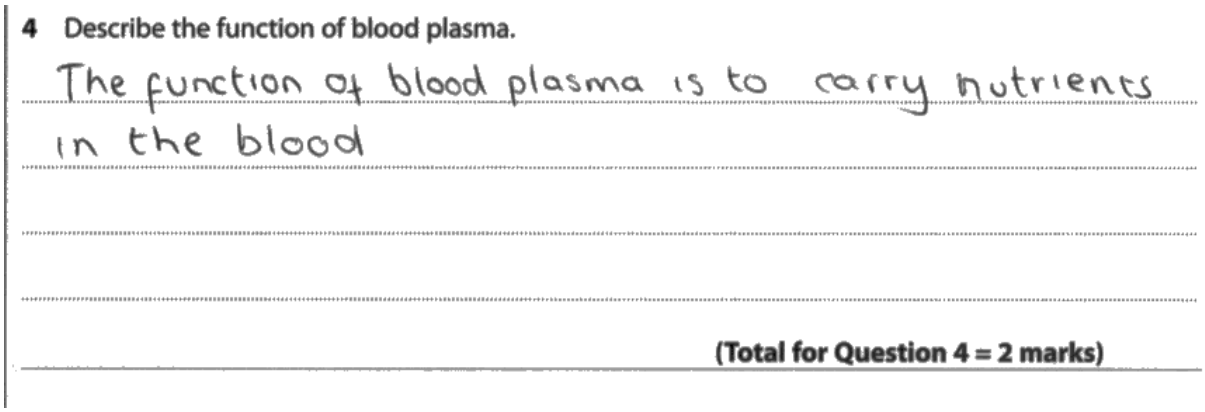
4 Describe the function of blood plasma.

Transport red blood cells and other nutrients in the blood. It is in a fluid form to allow easy transportation through the lumen of blood vessels.

(Total for Question 4 = 2 marks)

This response gained 2 marks

The learner provides the function of transportation and the linked descriptive point of red blood cells/nutrients.

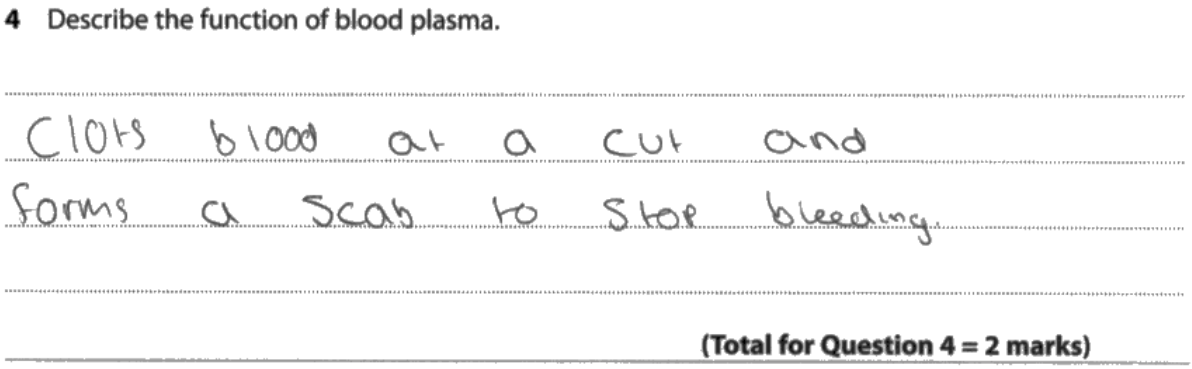

4 Describe the function of blood plasma.

The function of blood plasma is to carry nutrients in the blood

(Total for Question 4 = 2 marks)

This response gained 2 marks

The learner also provides the function of transportation 'carry' (1) and the linked description 'nutrients' (1)


4 Describe the function of blood plasma.

Clots blood at a cut and forms a scab to stop bleeding.

(Total for Question 4 = 2 marks)

This response gained 0 marks

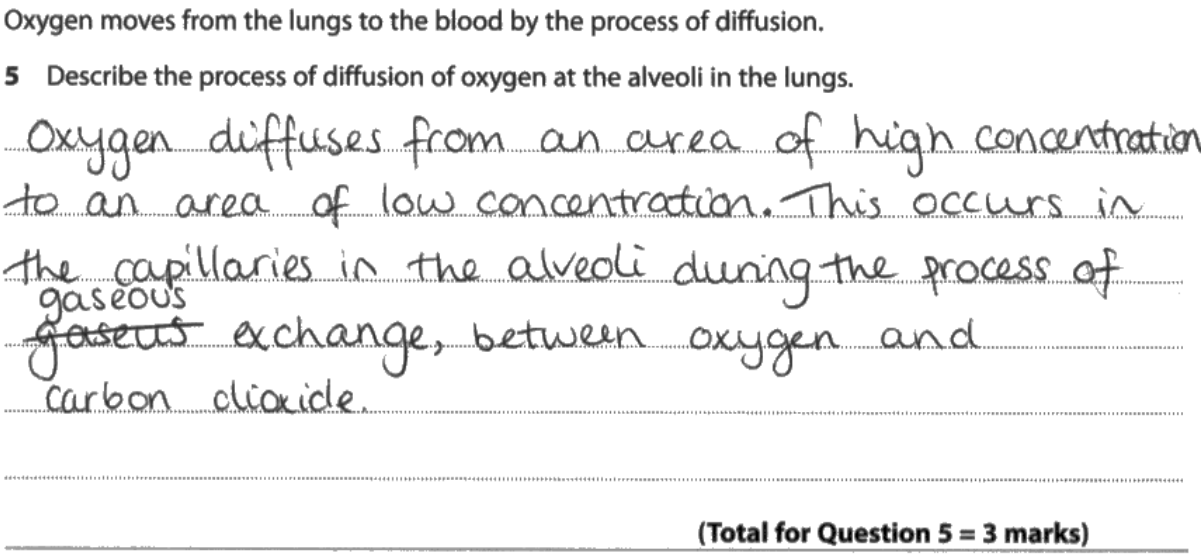
A minority of learners were describing the function of blood platelets (as previously examined) rather than blood plasma.

Q5

This question asked learners to describe the process of diffusion of oxygen at the alveoli.

This question was answered by a high number of learners by describing the process of gas exchange of oxygen and carbon dioxide. The question was requesting a description of how oxygen is able to diffuse at the alveoli. It may be very good example of ensuring students direct their response accurately to the question asked.

When answered, a proportion of learners were able to identify oxygen will move from an area of high to low concentration.



Oxygen moves from the lungs to the blood by the process of diffusion.

5 Describe the process of diffusion of oxygen at the alveoli in the lungs.

Oxygen diffuses from an area of high concentration to an area of low concentration. This occurs in the capillaries in the alveoli during the process of ~~gaseous~~ gaseous exchange, between oxygen and carbon dioxide.

(Total for Question 5 = 3 marks)

This response gained 1 mark

This learner accessed the most commonly accessed marking point by showing knowledge that the process requires an area of high to low concentration in order for oxygen to diffuse into the blood.

Oxygen moves from the lungs to the blood by the process of diffusion. High to low

5 Describe the process of diffusion of oxygen at the alveoli in the lungs.

The oxygen moves from high partial pressure in the lungs/alveoli to a low partial pressure in the blood vessels/capillaries. It passes through a semi-permeable membrane.

This response gained 3 marks

The learner has described that oxygen will be at a high partial pressure in the lungs. A linked descriptive point is evident by describing the partial pressure will be low in the blood. A final marking point is the identification of requiring a semi permeable membrane in order for process of diffusion to occur.

Oxygen moves from the lungs to the blood by the process of diffusion.

5 Describe the process of diffusion of oxygen at the alveoli in the lungs.

Diffusion occurs at the areoli where oxygen diffuses into the lungs, where as carbon dioxide is removed which is the process of gaseous exchange. Oxygen is diffused in. Blood in the capillaries, is diffused then the carbon dioxide is removed via the body. The areoli are small air sacs at the end of bronchioles which perform gaseous exchange.

(Total for Question 5 = 3 marks)

This response gained 0 marks

This was typical of the type of response seen frequently for this question when learners opted to described the process of gas exchange and/or link with carbon dioxide when in the fact the question was asking about oxygen only.

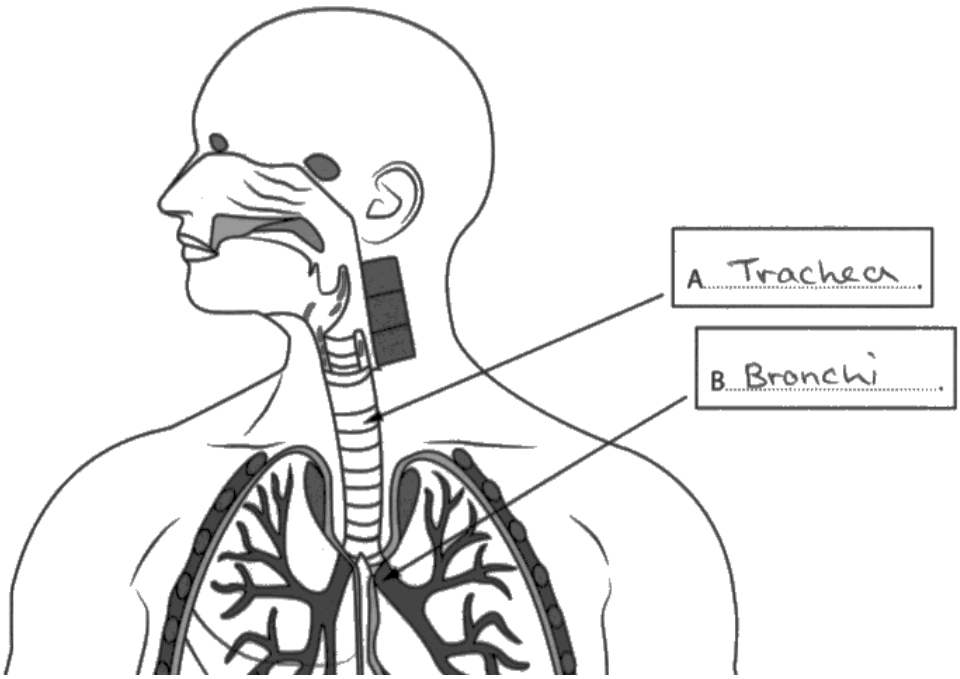
Q6a

This question was a highly accessible question and assessed learners' knowledge and understanding of the anatomy of the respiratory system.

Figure 2 shows the anatomy of the respiratory system.

6 (a) Identify the components labelled **A** and **B**.

(2)



This response gained 2 marks

The locations in this response are correctly identified.

There were varied responses from learners in this question for B and knowledge on the Bronchi and Bronchioles were on occasions inaccurate. The label is directed at the Bronchus/Bronchi.

Q6b

This question assessed learners' knowledge and understanding of the function of the diaphragm during inspiration. The command verb is describe. Therefore, to achieve full marks, learners are required to identify a function of the diaphragm when breathing in and then expand their answer with linked descriptive points. This question was answered well at all levels as most learners were able to describe the function of increasing the volume of the thoracic cavity by the breathing muscle 'contracting' and 'moving downwards'. There were some slight errors in learners providing a description of expiration in order to force air out.

(b) Describe the function of the diaphragm during inspiration.

(3)

During inspiration the diaphragm will contract and move down this will allow for the thoracic cavity to increase allowing more oxygen to be breathed in. As the diaphragm contracts the partial pressure of oxygen is less inside the thoracic cage than outside so oxygen will move in.

(Total for Question 6 = 5 marks)

This response gained 3 marks

This learner has accessed the two marking points in the first part of first sentence by stating the diaphragm with contract (1) and move down (1). For the second part of the sentence the learner links these to the thoracic cavity increasing in size (1).

It is worth nothing that the learner in this response also mentions a drop in partial pressure of oxygen (1) in order to draw air (1). Both of these marking points were seen frequently in other responses and credited accordingly.

(b) Describe the function of the diaphragm during inspiration.

(3)

During inspiration the diaphragm flattens and ~~pushes~~ stimulates the internal and external intercostal muscles to contract, which pushes both sides of the rib cage away from eachother creating a larger area for air to be breathed in, this area is called thoracic cavity.

(Total for Question 6 = 5 marks)

This response gained 2 marks

The learner identified the diaphragm flattens and a linked descriptive point for creating a larger thoracic cavity.

Q7

This question used an image of the shot put and the 5000m race. The command verb is explain. Therefore, to achieve full marks learners are required to identify the muscle fibre type most likely to be recruited and then support their answer to as to why it is primarily used in that event. This explanation point could have been either a characteristic of the chosen muscle fibre type OR a characteristic of the sport which links it clearly to that fibre type.

A high proportion of learners gained either two marks for identifying correct muscle fibre type in each 7a and 7b or for 7b were able to identify Slow Twitch muscle fibres (1) and regularly linking these to having a high resistant to fatigue (1) to be able to last the duration of the 5000m. Learners appeared more comfortable with 7b. There was some confusion in 7a between Type IIx and Type IIa. Some learners would simply state Fast Twitch/Type II muscle fibres which was too vague for credit.

7a

Figure 3

7 Explain the muscle fibre types most likely to be recruited in each activity in **Figure 3**.

(a) Shot put

(2)

The Shotputter will recruit Type IIx. This is a high level of force. This allows the Shotputter to burst the level of contraction to launch the

This response gained 2 marks

One mark has been gained for identifying Type IIx muscle fibre type, with a further mark gained for them having a high level of force.

Figure 3

7 Explain the muscle fibre types most likely to be recruited in each activity in **Figure 3**.

(a) Shot put

(2)

FO Fast oxidative

These are ~~most likely to be~~ ~~FG (Fast glycolitic)~~ fibre types due to the shot put requiring a quick burst of power. These fibre types are strong and powerful but not very good at endurance.

This response gained 0 marks

This response shows one of the common errors with this question. The fibre type is incorrect and therefore no further credit was available. A high proportion of learners also would explain using 'a quick burst of power or energy' as seen in this response. This was too vague as a linked explanation point for the Shot Put.

7b

(b) 5000 m running

(2)

The 5000m runners will recruit Type I. This is a low force of contraction to the muscles, which allows the runners to go on for a long period of time. It's alos High resistants of fatiguing. This lets the runners to keep going.

This response gained 2 marks.

One mark has been gained from identifying Type I muscle fibre type, with a further mark gained for them explaining a characteristic of having a low force of contraction. High resistance to fatigue is also evident here and was used by a high proportion of learners as the linked explanative point.

(b) 5000 m running

(2)

The muscle fibre type most likely to be recruited in 5000m Running would be Type II as they are being used over a long period of time at low intensity.

(Total for Question 7 = 4 marks)

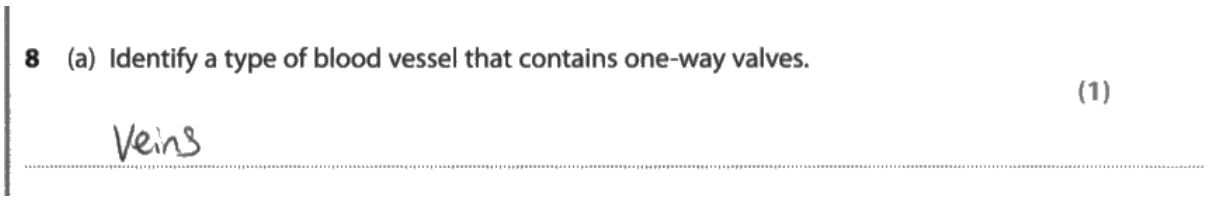
This response gained 0 marks

This response shows one an occasional error with this question. The fibre type is incorrect and even though the characteristic of the 5000m 'being used over a long

period of time at low intensity' is sufficient there was no further credit available once the fibre type was incorrect.

Q8a

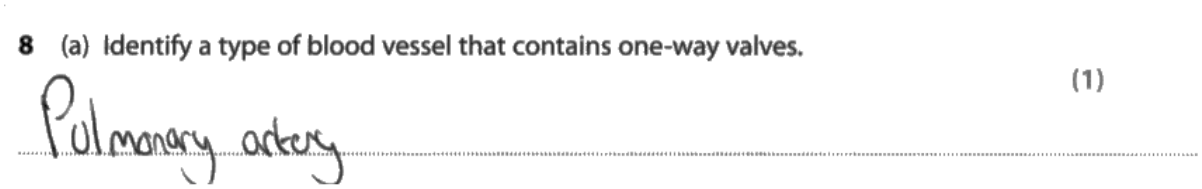
This question was a highly accessible question and assessed learners' understanding the blood vessels to contain valves; Veins or Venuoles. Unlike the response identified below many learners were confused with arteries/pulmonary artery/pulmonary vein, all of which did not gain credit.


8 (a) Identify a type of blood vessel that contains one-way valves.

(1)

Veins

This response gained 1 mark.


8 (a) Identify a type of blood vessel that contains one-way valves.

(1)

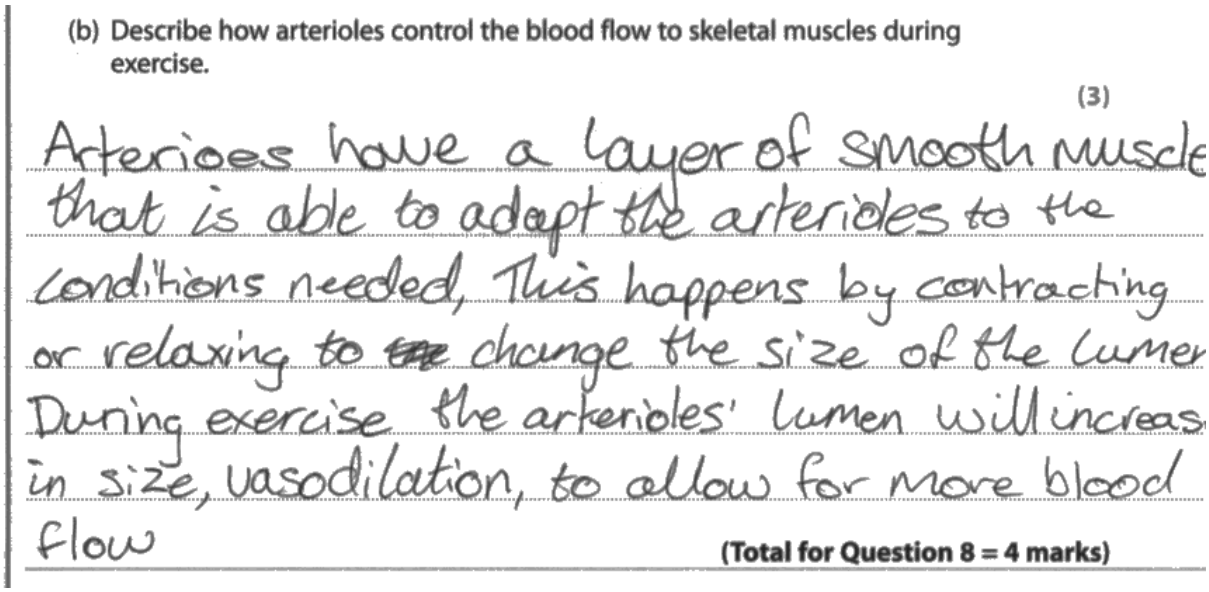
Pulmonary artery

This response gained 0 marks.

Q8b

The command verb for this question is describe. Consequently, in order to gain full marks, learners should provide a logical description of how the blood vessels; arterioles control blood flow. The key component to this question is how they control blood flow to the skeletal muscles during exercise.

The mark scheme should be viewed as an example answer. This question was designed to be accessible but with sufficient scope to stretch and challenge learners to apply their knowledge and understanding to exercise. Whilst there were some excellent answers, the learner responses to this question were varied and fluctuating and reflected a weak acknowledgement of the requirements of the question.



(b) Describe how arterioles control the blood flow to skeletal muscles during exercise.

(3)

Arterioes have a layer of smooth muscle that is able to adapt the arterioles to the conditions needed, This happens by contracting or relaxing to ~~the~~ change the size of the lumen During exercise the arterioles' lumen will increas in size, vasodilation, to allow for more blood flow

(Total for Question 8 = 4 marks)

This response gained 3 marks

This learner shows a response that is typical of a the excellent answers seen. In the last sentence the learner has correctly identified the vessels contain a lumen (1) which will increase in size (1) which is vasodilation (1). To allow for an increased 'more' blood flow is also sufficient for credit.

(b) Describe how arterioles control the blood flow to skeletal muscles during exercise.

(3)

During exercise, arterioles allow a certain amount of blood to the skeletal muscles based on the demand. For example in a 100m race, the arterioles would allow an increased blood flow to the legs because that is where oxygen is required.

(Total for Question 8 = 4 marks)

This response gained 1 mark.

This response demonstrates an understanding of the arterioles allowing an increased blood flow. There is no description of how this is achieved.

(b) Describe how arterioles control the blood flow to skeletal muscles during exercise.

(3)

Arterioles control the blood flow to the skeletal muscles during exercise by having a one-way valve. This valve supplies the amount of blood that is necessary to complete a certain action/exercise.

(Total for Question 8 = 4 marks)

This response gained 0 marks.

This learner did not gain any marks as they have not made it clear on how the vessel controls blood flow. They have made a link to the first part of question 8 and suggest valves control blood flow. This is the case for veins and venuoles but not credit worthy for the arterioles.

Q9

This question was designed to be accessible but with sufficient scope to stretch and challenge learners round their anatomical knowledge of ligaments. There were some excellent answers and overall the learner responses to this question were pleasing and reflected a sound understanding the key function of ligaments in the knee when kicking a football. Learners were able to use the image to support their application of the ligaments providing stability and stopping unwanted movement such a hyperextension/dislocation. A high proportion of learners were able to access 1 mark by stating ligaments attach bone to bone.

Figure 4

9 Explain the function of the **ligaments** in the **knee** joint during the kicking movement.

In the knee, ligaments stabalise and hold the joint in place to prevent any unwanted movement such as hyperextention. They also attach the femur to the tibia allowing for flexion and extension of the knee joint.

This response gained 4 marks

One mark awarded here for identifying the function; stablise. A second and third mark is awarded for explaining to 'prevent unwanted movement' which is further explained 'such as hyperextension'. This particular learner named the bones which the ligaments in the knee attach; Femur and Tibia, which was sufficient for bone and bone and the final marking point in this response.

Figure 4

9 Explain the function of the **ligaments** in the **knee** joint during the kicking movement.

The ligaments prevent any unwanted movement from occuring at the knee.
Ligaments also connect bone to bone, so would be connecting the femur and patella and also the patella to the tibia and fibula.
The ligaments also allow the movement at the knee to occur as they enable to joint to connect to the rest of the leg, therefore allowing movement.

This response gained 2 marks

This learner has identified that the ligaments prevent unwanted movement and then references that ligaments connect bone to bone. There is no further credit in this response. Many learners would refer to 'allowing movement' as seen in this response. This was not credited as the muscles create the movement by pulling on a bone whilst the ligaments then stop unwanted movement. Some learners would answer this question like a movement analysis question which is assessed later in the paper in the extended questions.

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.

The question asks learners to analyse the role of chemoreceptors in changing the rate of breathing during exercise. Almost all of the learners attempted this question and

were confident with the basic knowledge; that chemoreceptors detect a chemical change in the blood when exercise begins. Most were able to give an example of this change and apply their understanding to state the impact of this was to increase the breathing rate to meet the demand for oxygen. This was typical of a level 1 response.

Those learners who additionally explained how the chemoreceptors work together with the respiratory control centre (RCC) were able to access a level 2 mark, predominantly for 5 or 6 marks as they were able to give inter relationship as shown in the 'explained' section of the indicative content.

In order for learners to access level 3 grade descriptor, a more detailed and comprehensive description of the chemoreceptors was required. Learners could achieve this by including reference to a variety of points from the knowledge, explained and application section of the indicative content.

10 Analyse how chemoreceptors change breathing rate during exercise.

The Chemoreceptor change breathing rate during exercise because When you exercise your breathing and heart rate goes up and the chemoreceptor Changes the breathing rate because it detects the change because of the intensity

This response gained 2 marks

This response is typical of a basic level 1 response. It was not a response seen regularly within the series and it was clear learners were confident with the role chemoreceptors during exercise. There is isolated knowledge in that the receptors 'detect' a change. This learner has also provided application in stating the breathing rate goes up. There is a limited attempt the address the factors that occur to ensure the breathing rate changes.

10 Analyse how chemoreceptors change breathing rate during exercise.

~~Chem~~ Chemoreceptors detect the chemical change during the breathing process. As exercise occurs, there is a natural increase in carbon dioxide which then ~~incre~~ increases the acidity. When the acidity is increased, chemoreceptors detect this and sends ~~impulse~~ impulses to the brain. Once that is done, the brain then helps to regulate / control the breathing rate, as the process of gaseous exchange increases in the alveoli, having to exhale the carbon dioxide much quicker out of the lungs and the rest of the body, and transporting the oxygen to where it's needed most.

This response gained 5 marks

This is an example of a fairly typical level 2 response, seen many times this series. The learner shows the similar basic knowledge of 'detection' as the first exemplar response but the inter relationship with how this works is then clear. The learner has referenced accurate material; an increase in carbon dioxide leads to an increase in acidity, which demonstrates explanation of what happens during exercise. The learner finally shows application of what happens to accommodate exercise; increasing gaseous exchange and removing carbon dioxide quicker. Correct technical language is used throughout.

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, particularly in the knee.

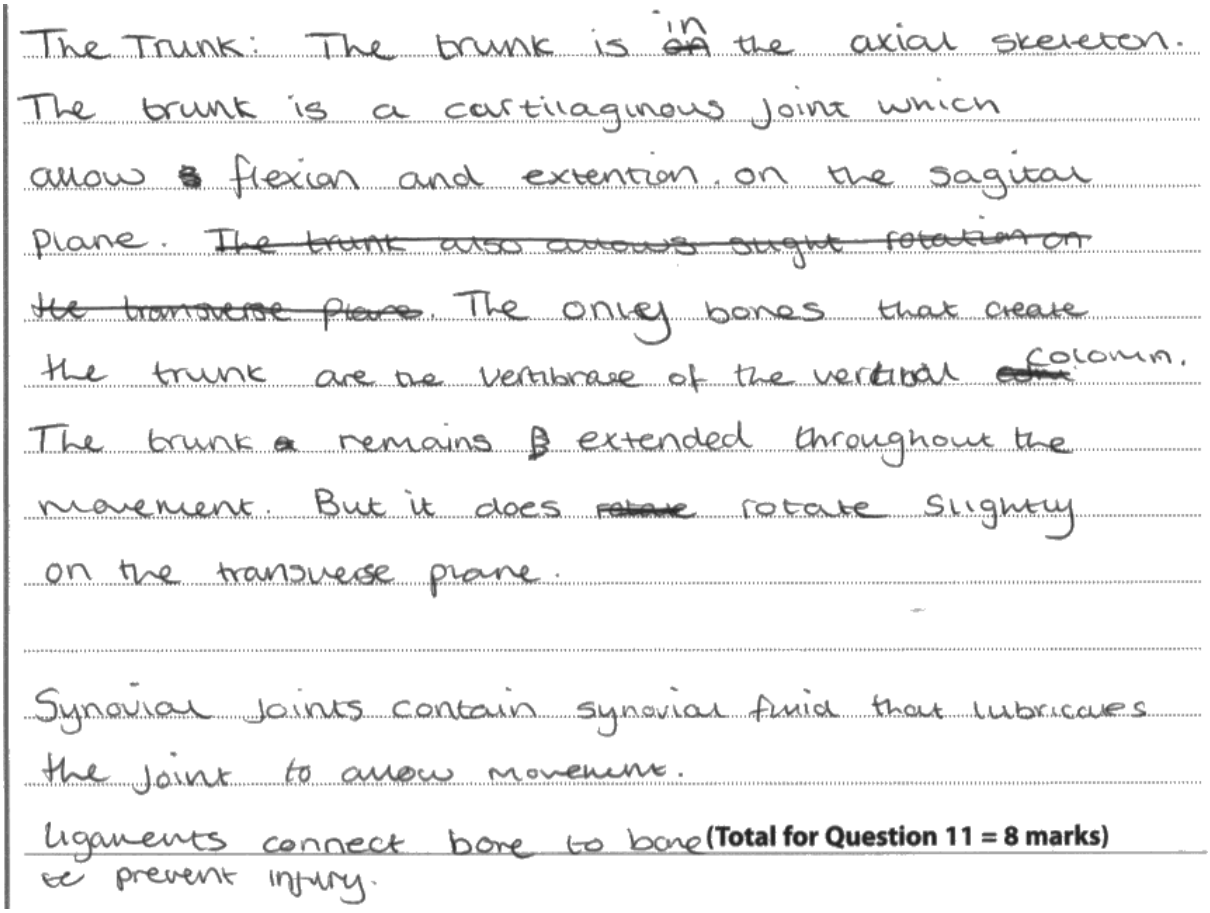
A number of learners found the trunk more challenging to analyse and had difficulty with all aspects of this joint, particularly the joint movement and plane. However, accurate analysis of the joint movement at the trunk enabled the question to differentiate between learners and was credited accordingly.

Almost all learners achieved at least marks in the Level 1 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 2 grade descriptor. It was promising to see a high proportion of learners providing a full analysis that demonstrated sustained knowledge of interrelationships and linked these to the context of the question in order to get into the Level 3 grade descriptor.

A small number of learners still made reference 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.

Left hip: The hip is part of the appendicular skeleton The left hip is a synovial ball and socket joint It is formed by the articulation of the femur and the pelvis. It works on the sagital, frontal and transverse plane. The movements allowed at the hip are abduction and adduction, Flexion and extention and circumduction and roteation. In the preparation phase the hip is extended. Whereas in the execution the hip is flexed. The left hip moves on the sagital plane to go from extended to flexed.

The left knee: The knee is a part of the appendicular skeleton. The left knee is a synovial hinge joint which allows flexion and extention on the Sagital plane. It is formed by the articulation of the femur and the tibia. In the preparation phase the knee is extended. Whereas in the execution phase the knee is flexed. The knee has moved on the sagital plane from Extention to flexion.



The Trunk: The trunk is in the axial skeleton. The trunk is a cartilaginous joint which allow flexion and extention on the sagital plane. ~~The trunk also allows slight rotation on the transverse plane~~. The onley bones that create the trunk are the vertebrae of the vertical column. The trunk remains extended throughout the movement. But it does rotate slightly on the transverse plane.

Synovial joints contain synovial fluid that lubricates the joint to allow movement.

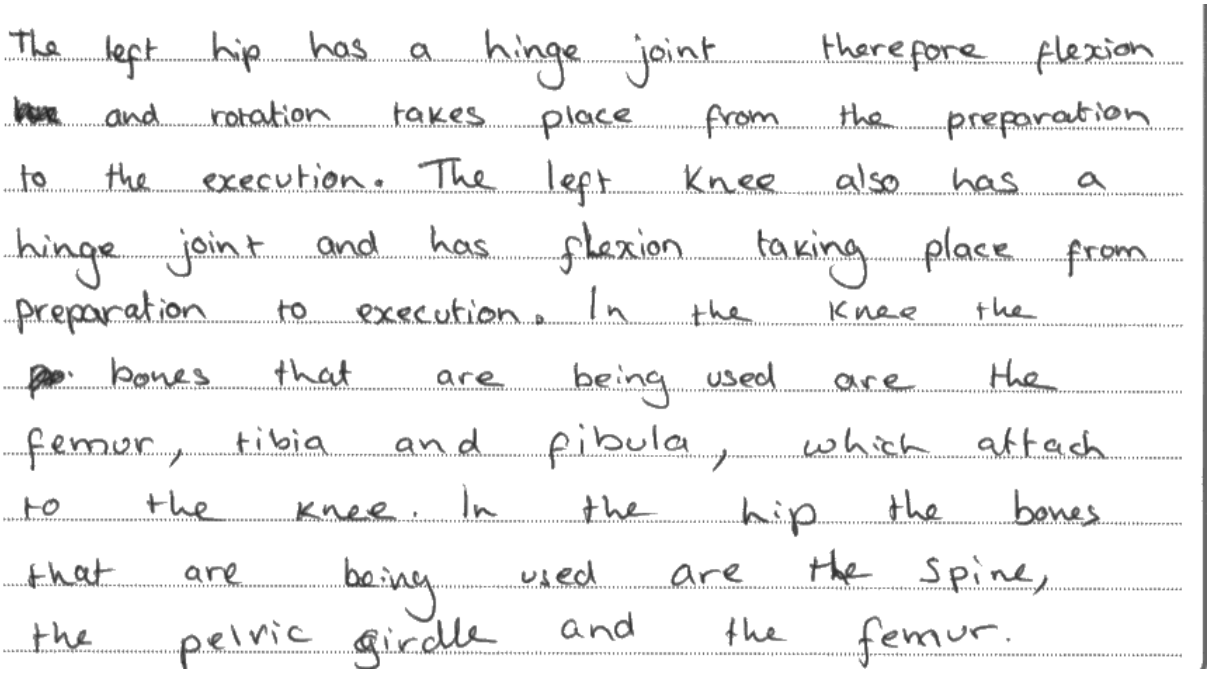
ligaments connect bone to bone to prevent injury.

(Total for Question 11 = 8 marks)

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 with the lunge and twist action. Learner has shown good linkage by integrating the rotation of the trunk through the transverse plane.

Additional factors are included with the range of movements available at those joints.


The left hip has a hinge joint therefore flexion and rotation takes place from the preparation to the execution. The left knee also has a hinge joint and has flexion taking place from preparation to execution. In the knee the bones that are being used are the femur, tibia and fibula, which attach to the knee. In the hip the bones that are being used are the spine, the pelvic girdle and the femur.

This response gained 3 marks

At the hip joint, the incorrect joint type is identified but the movement and bones are correctly identified. At the knee joint, the learner has focussed on the execution phase and correctly identified the hinge joint, flexion and the articulating bones. There is no attempt to address the trunk. The response demonstrates isolated elements of knowledge.

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 elbow, ankle and shoulder to achieve the position shown from preparation phase to execution phase of a tennis forehand shot.

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

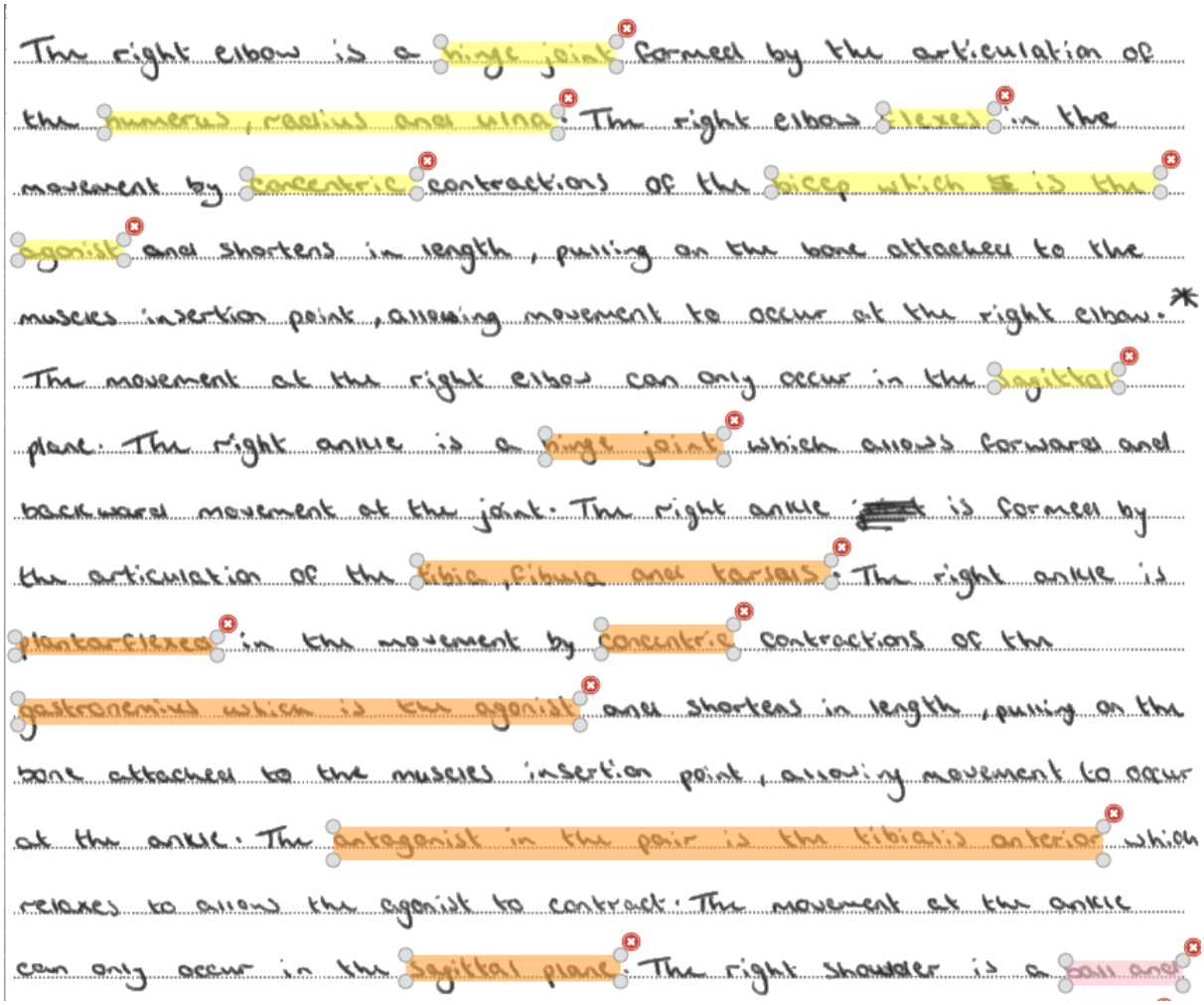
A high proportion of learners have delivered a structured response based on a pre-planned strategy, often shown by tables that were drawn at the start of the learners' response or the diagram being annotated.

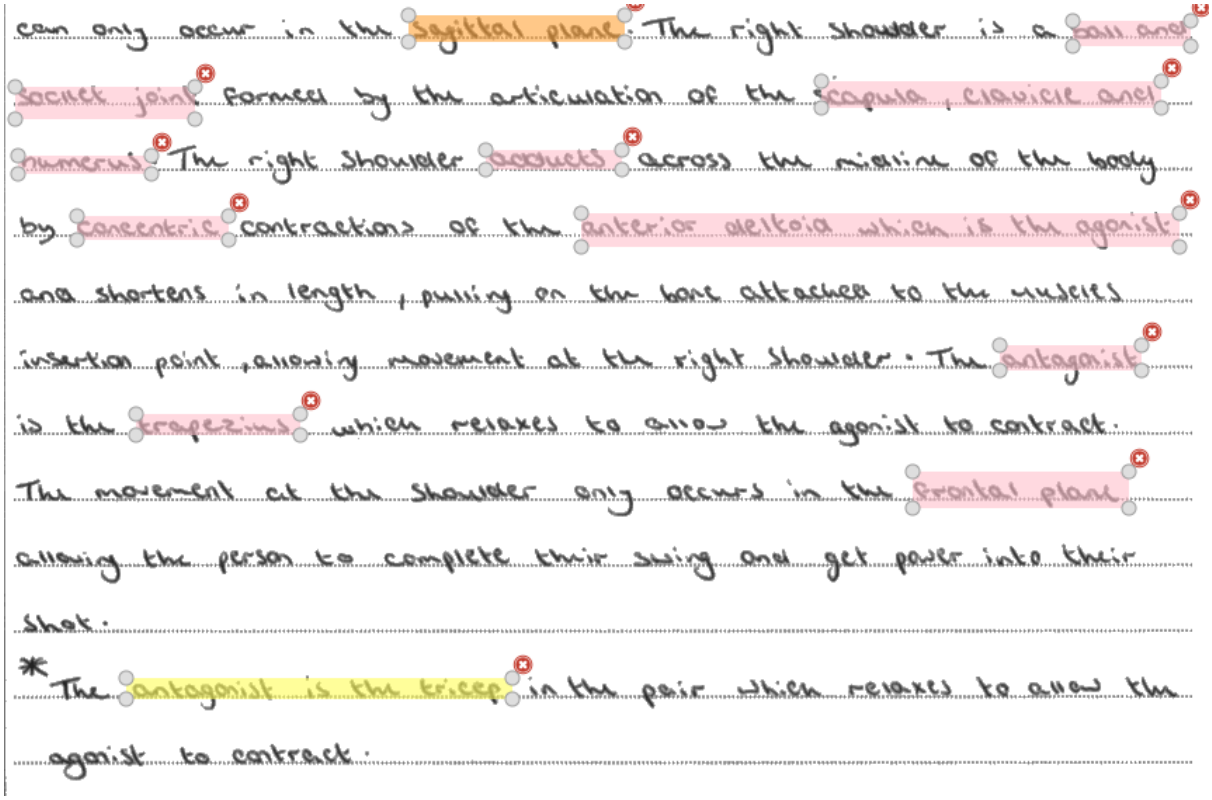
A number of factors make this question accessible with suitable stretch and challenge to learners on this paper compared to the previous series. The elbow and ankle have been assessed before and generally learners accurately analysed the two types of joints involved, the articulating bones and the joint movements. A number also included the correct antagonistic muscle pairs, types of contraction or planes of movement and this was written in a succinct analysis with only focus on the execution phases as requested by the question.

The antagonistic muscle pairs at the knee and ankle were stated, but those involved at the shoulder seemed to prove slightly more challenging to learners, as was the type of movement and plane of movement. Similar to Q11, where these were identified they were credited accordingly.

Some 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 create the tennis forehand shot movement from preparation to execution and achieved marks at the top end of the level 3 grade descriptor.


The right elbow is a hinge joint formed by the articulation of
the humerus, radius and ulna. The right elbow flexes in the
movement by concentric contractions of the bicep which is the
agonist and shortens in length, pulling on the bone attached to the
muscles insertion point, allowing movement to occur at the right elbow.
The movement at the right elbow can only occur in the sagittal
plane. The right ankle is a hinge joint which allows forward and
backward movement at the joint. The right ankle is formed by
the articulation of the tibia, fibula and talus. The right ankle is
plantarflexed in the movement by concentric contractions of the
gastrocnemius which is the agonist and shortens in length, pulling on the
bone attached to the muscles insertion point, allowing movement to occur
at the ankle. The antagonist in the pair is the tibialis anterior which
relaxes to allow the agonist to contract. The movement at the ankle
can only occur in the sagittal plane. The right shoulder is a ball and



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 of the movement. The yellow highlighting demonstrates this for elbow, orange for the ankle and pink for the shoulder. Therefore, it receives a maximum mark of 14 and is clear of the level 3 grade descriptor.

Figure 6

12 Analyse the required movement at the:

- right elbow - bicep, tricep + wrist flexors
- right ankle - gastrocnimicus + tibias
- right shoulder - deltoids ; bicep + tricep

to move from preparation to execution.

(14)

	bones	movement	joint	planes
Right elbow	Humerus, ulna + radius	adduction + abduction	Hinge	Transverse + Sagittal
Right ankle	Tibia, fibia, Tarsals + metatarsals	dorsi + planta flexion	pivote	Transverse
Right Shoulder	Clavical, Scapula + humerus	adduction + abduction	Ball + Socket	Transverse

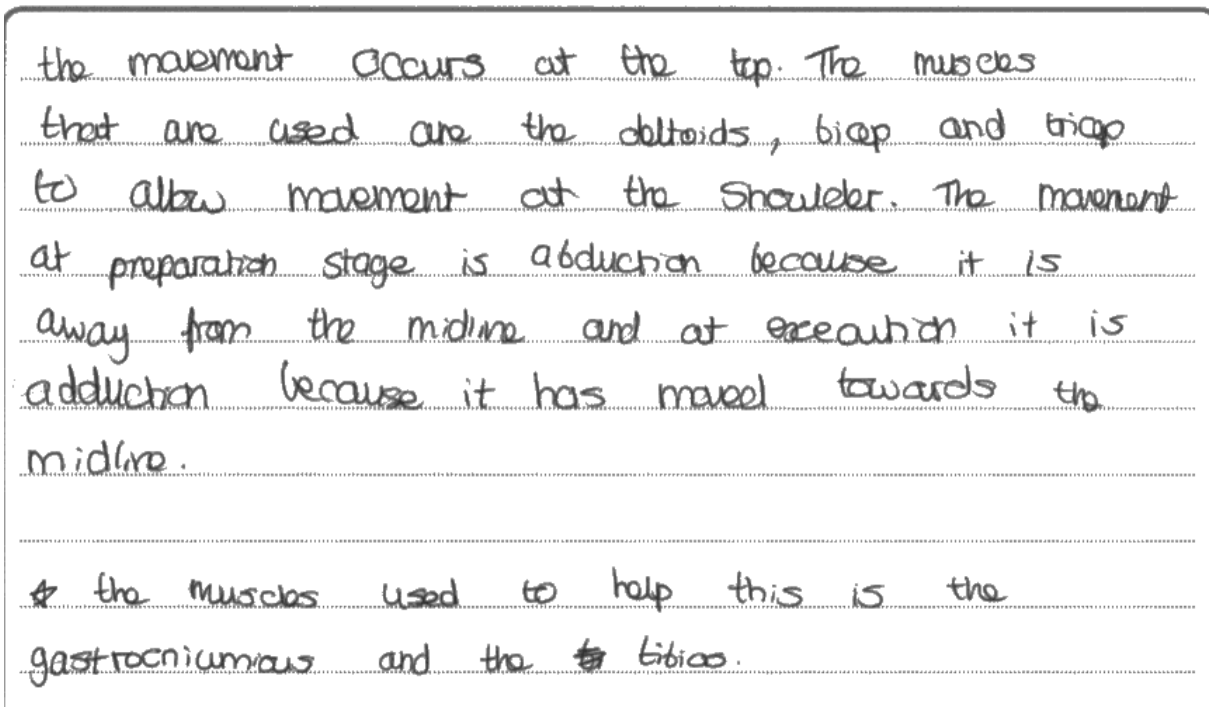
when it comes to movement, you need to be aware of the bones that are being used, along with the muscle, also the planes of movement and the type of joint and final what type of movement is happening at the stage of the preperation phase and the execution phase.

At the preparation stage of the right elbow, not a lot is happening at this moment, the bones that are being used are the humerous which is located at the upper arm and the radius * and ulna which is located at the lower arm,. The movement that has taken place at this moment is abduction because the arm is away from the midline of the body causing more pressure on the muscles that are being used at the upper arm which is the bicep and tricep. The muscles will help with the movement that needs to occur because they will contract and relase at the elbow joint which is known as the hinge joint which will allow movement at the elbow. At the preparation stage the planes of movement is transverse because it has divided the body top and bottom. Now that the execution stage has taken place the movement has now become adduction which is towards the midline of body, this is because the tennis player has moved

his arm across him. Also the plane of movement is still the same but it could also be sagittal because that divides the body left and right and the arm has moved across the body.

At the preparation stage of the right ankle, the bones that are being used are the tibia and fibia which are the lower leg bones and the tarsals and metatarsals which are located in the foot. Throughout the preparation stage, the planes of movement will always be transverse because the body has been divide top to bottom. The hinge joint is at the ankle, this will allow movement and allow the ankle to rotate. At the upper preparation stage, the ankle is dorsi flexion which is where the toes are pointing up toward the shin, this is because the tennis player is stationary. However this changes at the execution stage as the player has jumped and his feet are pointed meaning the movement is planta flexion *

At the preparation stage of the right shoulder, the joint that is being used throughout is the ball and socket which the humerous, clavical and the scapula bones is all attached. At the shoulder the plane of movement that has occured is the transverse because that divides the body top and bottom and



the movement occurs at the top. The muscles that are used are the deltoids, biep and triep to allow movement at the Shoulder. The movement at preparation stage is abduction because it is away from the midline and at execution it is addiction because it has moved towards the midline.

* the muscles used to help this is the gastrocniumius and the * tibios.

This response gained 7 marks

This learner does not seem to have planned or executed a particular strategy to answer this question however has focussed on the preparation and execution stage. This has created a lengthy analysis which is then missing key parts of the indicative content.

This response demonstrated some accurate knowledge as per the level 2 descriptor. Each joint has been analysed and links have been considered in places with reference to the tennis movement. For example,

Elbow; the learner has identified the correct bones, both muscles, type of joint and plane of movement. At the Ankle; the learner has identified the correct bones, type of joint and joint movement. Both muscles (gastrocnemius and tibialis) are also credited. Finally, at the Shoulder; the learner has identified the correct bones, type of joint and joint movement. Talking about the 'deltoids' as a plural muscle is given some credit, however both deltoid muscles or the correct agonist and antagonist would require to be named to access a higher level. The plane of movement has been attempted with reference to adduction which does relate to movement towards the mid-line.

Summary

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

- Recognise that this paper is assessing knowledge of anatomy. Whilst an understanding of general principles and functions of the body is required, the majority of the marks on this exam are awarded for detailed anatomical knowledge. This will usually include the location, and structure of the component parts of the systems included in the specification, and their specific role in the functions of those systems.
- 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) in order 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 in order to become familiar with the structure of the exam and expected responses, particularly for question 11 and question 12.
- In question 11 and 12 focus on the movement from the preparatory phase to execution phase of the movement for analysis and use this report to appreciate what is required for full analysis for each joint asked in the question.