L3 Lead Examiner Report 1906

June 2019

L3 Qualification in Sport

Unit 1: Anatomy and Physiology (31524H)

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31524H – Unit 1: Anatomy and Physiology

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	0	11	22	39	56

Introduction

This was the fifth series of the new specification, and the fourth time that this unit has been assessed under the new rubrics. Centres and candidates should be congratulated on their preparation for this assessment format. Overall, candidates performed in line with the January series and it was obvious that they prepared for many of the specification topics covered in this assessment, to which they need congratulating for.

The question paper followed the format identified in the sample assessment materials. The paper was split into six sections. Each section was based on a sport or exercise scenario and required candidates to demonstrate knowledge and understanding of a range of specification topics and apply this knowledge to the specific question scenario. Each section is weighted in accordance to the specification design.

As in January the extended response questions were marked using a 'levels based' approach to assessment where the overall quality of the response was considered rather than the specific number of facts stated from the indicative content, although this obviously had a bearing on the quality of the response. The remainder of the questions on the paper were assessed using a traditional points-based approach, where a mark was given for each appropriate point. More detail can be found below in the individual question section of the report.

Introduction to the Overall Performance of the Unit

This report has been written to help you understand how candidates have performed overall in the exam. For each question there is a brief analysis of candidate responses. You will also find examples of candidate responses to the questions that have been well answered. These should help to provide additional guidance. We hope this will help you to prepare your candidates for future examination series.

Candidate performance varied throughout the paper. Whilst the extended response questions still provided the greatest challenge, most candidates gained some marks for these questions. The style of the assessment is challenging due to the depth and breadth of knowledge required to fully address the demands of the paper. The extended writing questions account for just over 30% of the paper, each question demanding depth of knowledge, but across the paper this also

requires breadth as each of these questions examines different areas of the specification.

The assessment is also challenging due to the need to apply knowledge not only in the extended answer questions but also the 'points-based' questions.

It was clear that some candidates did not make full use of the stimulus material provided in the question, but this continues to get better series by series. To reiterate with explain command verb questions there is an expectation that knowledge and understanding tested is applied to the situation in context and expansion marks are awarded accordingly.

As always the emphasis in this paper is on candidate's application of their knowledge to a variety of practical sports related situations. The higher marks, particularly in levelled response questions (Sections C-F), will always focus on the ability to demonstrate application rather than the ability to recall theory. It will be important for candidates to have the opportunity to practice this in their preparation for the assessment. Candidates that were able to access higher marks for these questions were able to apply their knowledge and understanding to the stimulus and provide realistic and appropriate responses.

As this is a vocational sports related subject, the external assessment seeks to put the candidates in applied sporting related situations and asks them to respond to these: this method of questioning will continue in the future. It is therefore essential that centre's stress to candidates the need to read the stimulus information carefully before they answer questions, and be prepared to use this information within their responses, this also applies when graphical or statistical data is supplied.

Where candidates are unable to apply the stimulus in their answer it will significantly restrict the number of marks candidates can receive. Generic responses will only gain limited credit.

Where the stimulus material uses a particular sport, it is not necessary for candidates to have an in-depth knowledge of this type of sport in order to answer the questions well, however, an awareness of the basic requirements of sports are expected which will have been covered in core curriculum PE lessons throughout KS3 and KS4.

Individual Questions

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

The majority of candidates performed as anticipated on this question, with many identifying the clavicle, sternum and ribs as correct answers. It is important that technical terminology is used and phonetic spelling was credited. Common errors were clavicle being labelled as the scapula

This response gained 3 marks

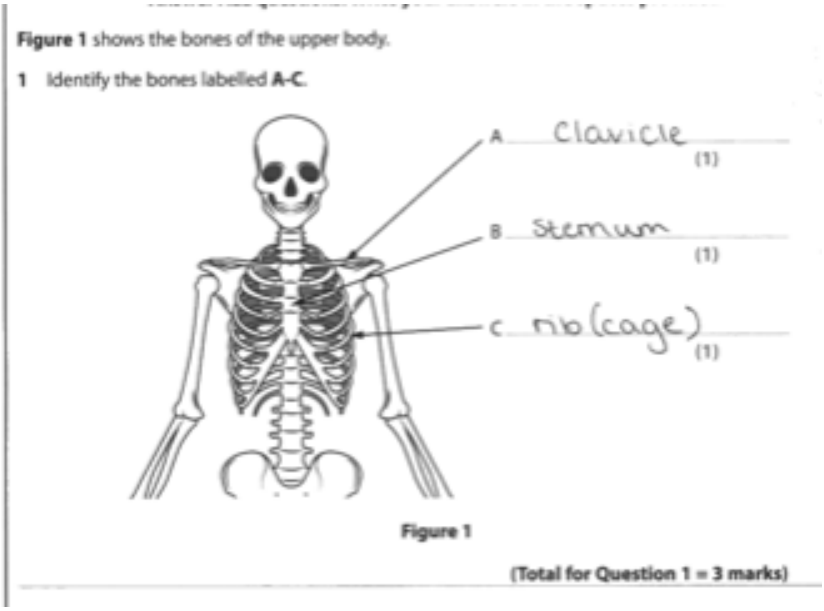


Figure 1 shows the bones of the upper body.

1 Identify the bones labelled **A-C**.

A clavicle (1)

B sternum (1)

C rib (cage) (1)

Figure 1

(Total for Question 1 = 3 marks)

This response gained 2 marks

Q2 (a) and Q2 (b)

Candidates were required to identify a fibrous joint and characteristics of that type of joint. On the whole candidates struggled to answer both of these questions effectively. Common errors made were giving an example of a synovial joints and providing their function rather than characteristics, for each joint type it is important for centres to relate this to both characteristics and functions.

This response gained 1mark

Joints are classified by how much movement they allow.

One category of classification is a fibrous joint.

2 (a) Give an example of a fibrous joint.

(1)

~~Spine of Vertebral~~ Cranium

This response gained 1 mark for answer 1 characteristic, but answer 2 is a function.

(b) State **two** characteristics of a fibrous joint.

(2)

1 They are a fixed joint so they dont move

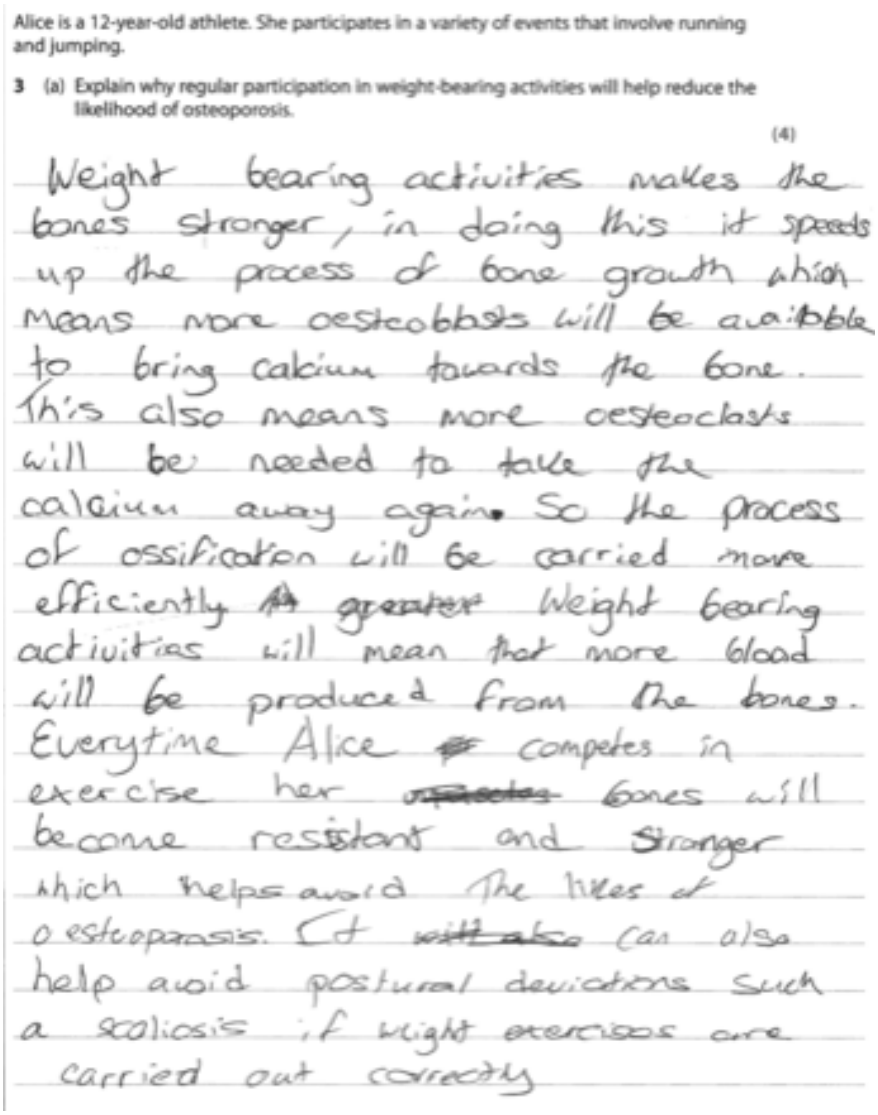
2 provide stability

(Total for Question 2 = 3 marks)

Q3 (a)

Candidates were required to explain why weight bearing activity will help reduce the likelihood of osteoporosis. Many identified by increasing the strength of the bones, amongst other correct answers.

This response gained 4 mark.



Alice is a 12-year-old athlete. She participates in a variety of events that involve running and jumping.

3 (a) Explain why regular participation in weight-bearing activities will help reduce the likelihood of osteoporosis.

(4)

Weight bearing activities makes the bones stronger, in doing this it speeds up the process of bone growth which means more osteoblasts will be available to bring calcium towards the bone. This also means more osteoclasts will be needed to take the calcium away again. So the process of ossification will be carried more efficiently ~~A greater~~ Weight bearing activities will mean that more blood will be produced from the bones. Everytime Alice ~~is~~ competes in exercise her ~~muscles~~ bones will become resistant and stronger which helps avoid the likes of osteoporosis. It ~~will also~~ can also help avoid postural deviations such a scoliosis if weight exercises are carried out correctly

Q3 (b)

The majority of candidates gained a mark for this question by correctly identifying that resistance training can stunt growth. Common errors that were made by candidates was to bring in the muscular system, it is important for centre's to stress to candidates that each section will only receive credit for answers related to that system, rather than other systems. The only exception to this rule is the final synoptic question. Other errors were not being specific enough and saying the body is still developing, rather than the bones are still developing.

This response gained 3 marks.

Alice wanted to start resistance (weight) training, but has been told by her doctor that she is too young to do so.

(b) Explain why resistance (weight) training is not recommended for children.

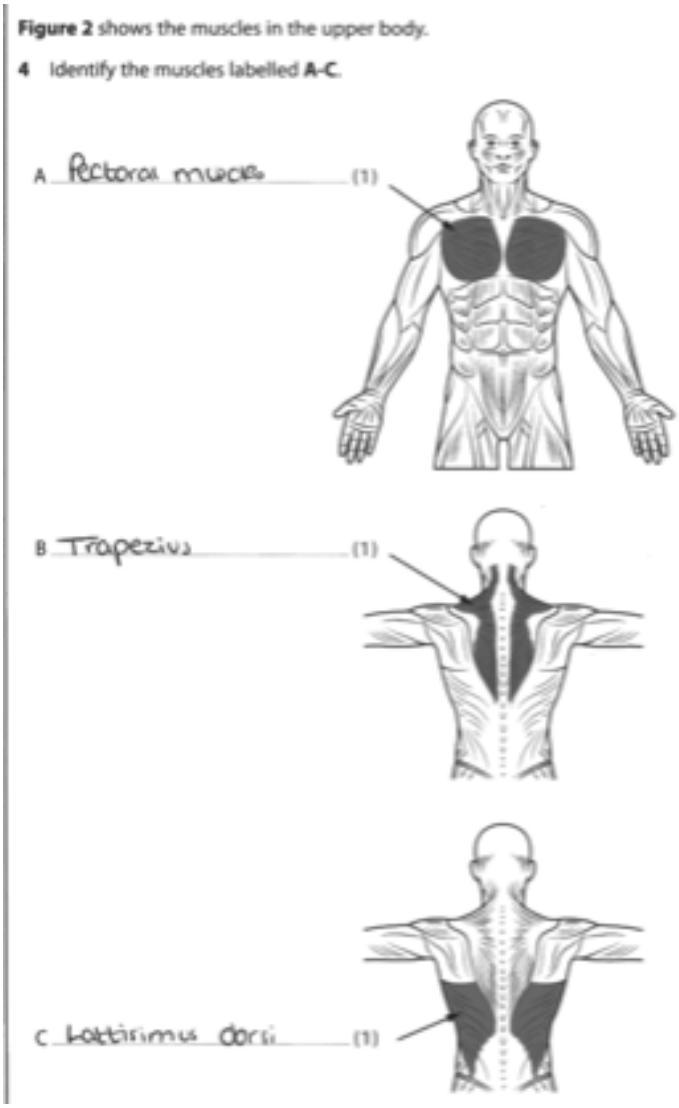
(3)

Childrens bones are still developing, therefore resistance training can damage the growth of the bones. This is because the epiphyseal plates (growth plates) would be damaged which will cause stunted growth.

Q4

The majority of candidates performed as anticipated on this question, with many identifying the pectorals, trapezius and latissimus dorsi as correct answers. It is important that full technical terminology is used, candidates who wrote pecs/lats did not receive the mark, as always phonetic spelling was credited. It is important for centres to only teach the muscles on the specification and use the names provided rather than shortened versions. Other common errors were the latissimus dorsi being labelled as the obliques.

This response gained 3 marks



Q5

The majority of candidates gained the at least one of the three marks available for this question, with many achieving the mark for identification of they are a fast twitch fibre. Common errors made were that the functions/where these fibres would be used rather than characteristics of the fibre, as well as getting these fibre types confused with Type I.

This response gained 3 marks

5 State **three** characteristics of type IIx muscle fibres.

1 Type IIx muscle fibres produce the most force out of all 3 muscle fibres.

2 Type IIx muscle fibres are anaerobic meaning they do not require oxygen.

3 They fatigue the quickest out of all 3 muscle fibres.

(Total for Question 5 = 3 marks)

Q6

The majority of candidates found this question challenging, often giving functions rather than characteristics. Additional common errors were mixing up smooth muscle with skeletal muscle.

This response gained 2 marks

6 State **two** characteristics of smooth muscle.

1 found in walls of blood vessels

2 contracts without you telling it to be or without conscious control

Q7 (a)

The majority of candidates gained the mark for stating that increased muscle glycogen enables more energy to be available.

Common errors were repeating the stem of the question, and not applying it directly to the benefits of the race. Using the statement 'run for longer' will not generate any marks, because it is a set distance, the statement 'running at a higher intensity for longer in the race' would be awarded the application mark.

This response gained 2 marks

Julie is a marathon runner.

Julie has trained for many years so her body has adapted to increase the storage of muscle glycogen.

7 (a) Explain why an increased storage of muscle glycogen benefits Julie during a race.

(2)

This will benefit Julie as she will have more glycogen / energy throughout the race available to her working muscles preventing her from fatigue. for a long period of time.

Q7 (b)

Question 7b was an extension to the previous question, but asking why muscle temperature increases. Common errors, were 'the result of increased temperature; 'makes it more pliable and therefore reducing chances of injury' rather than why temperature increases.

This response gained 3 marks

Julie is on a training run. One response to the run is that the temperature of her muscles increases.

(b) Explain what causes muscle temperature to increase during exercise.

(3)

While exercising, more blood is transported to the working muscles. This ends up resulting in more respiration occuring. One of the by products is heat, so with more respiration occuring, then more heat will be produced. This is why muscle temperature increases in exercise.

Q8

This question proved to be a good differentiator, evident through the spread of marks. It was clear that those candidates who understood the process scored highly with succient answers. Some ccandidates found this question difficult to access all available marks; many achieved two marks for correct identification of the diaphragm relaxes and air rushes out. The candidates could articulate the mechanisms but lacked detail and clarity desired by the mark scheme linked to pressure and thoracic cavity size. It is important for centres to teach the mechanisms of breathing in four sections (muscles, impact of thoracic cavity, pressure and air flow)

This response gained 4 marks

8 Describe the mechanism of breathing for **expiration** at rest.

When at rest and you wish to expire your extere intercostal muscles will relax and the interior intercostal muscles will contract. This decrease the volume of space in the thoracic cavity. Alongwith this the diaphram will contract upwards again lower the volume of space. Both of these things will work together to cause the pressure in the lungs to rise from low to high. In order to force the CO^2 out of the longs.

Q9 (a) & Q9 (b)

The following were recall questions looking at lung volumes and the impact that altitude has on an individual's breathing rate the first question required candidates to state the meaning of the term vital capacity. Common errors were no reference to maximum, and consequently very few accessed the mark. The vast majority of candidates accessed the mark for 9b.

This response gained 1 marks

9 (a) State the meaning of the term 'vital capacity'.

(1)

Tidal volume + inspiratory reserve volume + expiratory reserve volume

This response gained 1 mark

(b) State the effect that altitude has on a person's breathing rate.

(1)

Breathing rate increases

Q10 (a)

Candidates were required to explain the effect an increased tidal volume would have on performance. The majority of candidates correctly identified that that it would mean more oxygen being breathed in and then could apply this to the effect on performance. Less candidates stated that it would also result in more carbon dioxide being exhaled from the body and the implications on performance in the cross-country. Common errors encompassed a lack of application to the question and answers provided were very general, such as run for longer.

This response gained 4 marks.

Shelly is a cross country runner. During a training run her tidal volume increases.

10 (a) Explain the effects an increased tidal volume would have on Shelly's cross country performance.

(4)

An increased tidal volume means that Shelly will be able to take in more air when breathing, this means that she will have a larger supply of oxygen available which can be delivered to the working muscles and used as energy. It also improves her ability to remove lactate building up in the muscle and removing CO2 carbon dioxide which allows Shelly to maintain a high intensity for a longer period of time during her run and also prevents her muscles from fatigue longer than usual so she can keep running at a high intensity for longer.

Q10 (b)

This was the first extended response question of the paper and focused on the how breathing rate is controlled. Responses for the question required focus on the effects neural and chemical control and the indicative content was written accordingly to encompass this knowledge and application.

Like all of the extended response questions, the quality of candidates' responses varied. Some candidates were clearly very knowledgeable about increased neural and chemical control of breathing. Other candidates were unable to address the question fully due to confusion between the cardiovascular system and respiratory system.

Level 1 responses tended to focus on one area or provided a list with no development of the points within the indicative content. At level 3 candidates' responses provided accurate knowledge of neural and chemical control, used technical terminology with clear development of the point.

Overall this was a challenging question and it was obvious from a number of responses that this knowledge was lacking, although a clear specification point.

A number discussed the impacts on the cardiovascular system, when it was in the respiratory section.

This response was placed at Level 3 and given 5 marks. The answer clearly assesses a number of points from the indicative content, focusing on effects on neural and chemical control of breathing, with appropriate development in reference to the question.

During the training session, Shelly's breathing rate increases.

(b) Analyse how Shelly's increased breathing rate is controlled. (6)

Breathing rate is controlled in two ways chemically and nural both these do the same thing but in different ways.

chemical breathing works ~~by the body~~ when the pH levels in the blood stream drop and the blood becomes more acidic having more CO_2 present. A signal is then sent to the ~~rebulin~~ rebdulin ambliginaten which in at the ~~bot~~ bottom of the brain, this is a chemo receptor. This then decides where to increase the breathing rate or not. If pH is low breathing rate will increase to help to increase the pH and lower the levels of CO_2 present in the blood stream.

Nural: works by the ~~lower~~ # nerves in the body pick up signals about pH levels, then they send a signal to the rebdilin ambliginaten to decrease or increase the breathing rate to help increase the pH in the blood stream and lower CO_2 present by inhaling more oxygen and exhaling more CO_2 more ~~or~~ often and ~~no~~ deeper per breath

As Shelly is completing ~~an~~ aerobic endurance her breathing rate will have increased as there is large counts of CO_2 present ~~gitta~~ ~~which~~ which has been given off by the working muscle cells in ~~body~~ muscle groups like the glands and hamstrings. Breathing deeper and more often allows

shelly to have more oxygen diffusing and gas exchange in the alveoli and to muscle cells.

Q11

This was a recall question for identifying component parts of the cardiovascular system from their descriptions. Generally candidates under-performed on this question with the vast majority accessing at least one mark for the aorta. Common errors were stating bicuspid/tricuspid valve, instead of the semi-lunar valve.

This response gained 4 marks.

11 Name the structures **A–D** described in **Table 1**.

Structure	Description
A- Aorta	The body's main artery, originating from the left ventricle and carries oxygenated blood.
B- Vena cava	A blood vessel that receives de-oxygenated blood from the body to empty into the right atrium.
C- Pulmary vein	Blood vessel that supplies oxygenated blood to the heart muscle.
D- Semi-lunar valve	Prevents backflow of blood into the ventricle.

Q12

This was a new concept and examined for the first time, on the whole candidates performed well on this question, with a number accessing both available marks. Common errors were mixing up a heart attack, with the heart stopping due to an irregular beat.

This response gained 2 marks.

12 Describe sudden arrhythmic death syndrome (SADS).

It can occur in healthy living athletes, it is when your heart rhythm is disrupted and then out of sync which can lead to your heart stop pumping blood and stop working and then die.

(Total for Question 12 = 2 marks)

Q13 (a)

This question again acted as a good differentiator, generally candidates achieved one mark for the concept of recovering from playing, which is the first point on the mark scheme. Generally candidates did not access the second point on the mark scheme that it enables him to play again

This response was awarded 2 marks.

Imran is a rugby player. He has been playing for several years and his body has undertaken cardiovascular adaptations. One of these adaptations is a decreased heart rate recovery time.

13 (a) Explain how a decreased heart rate recovery time benefits Imran's rugby performance.

(2)

A decrease heart rate time would benefit Imran's performance because he tackle, run and sprint and be able to recover faster to allow him to continue to tackle, run and sprint for a longer period of time.

Q13 (bi) and Q13 (bii)

The following were recall questions looking at cardiac output and the impact that performance has on it; first question required candidates to state that it increases, to which the vast majority did. The second question required candidates to identify the two components that needed to be changed to have an impact on cardiac output. Common errors were increased breathing rate.

This response was awarded 1 mark.

Imran is playing in a rugby match.

In the match, Imran's cardiac output changes from rest.

(b) (i) State what happens to Imran's cardiac output during a rugby game.

(1)

It increases.

This response was awarded 2 marks.

(ii) State the **two** cardiovascular responses of the body that cause this change in cardiac output.

(2)

1 Increased heart rate

2 Increased Stroke Volume.

Q13 (c)

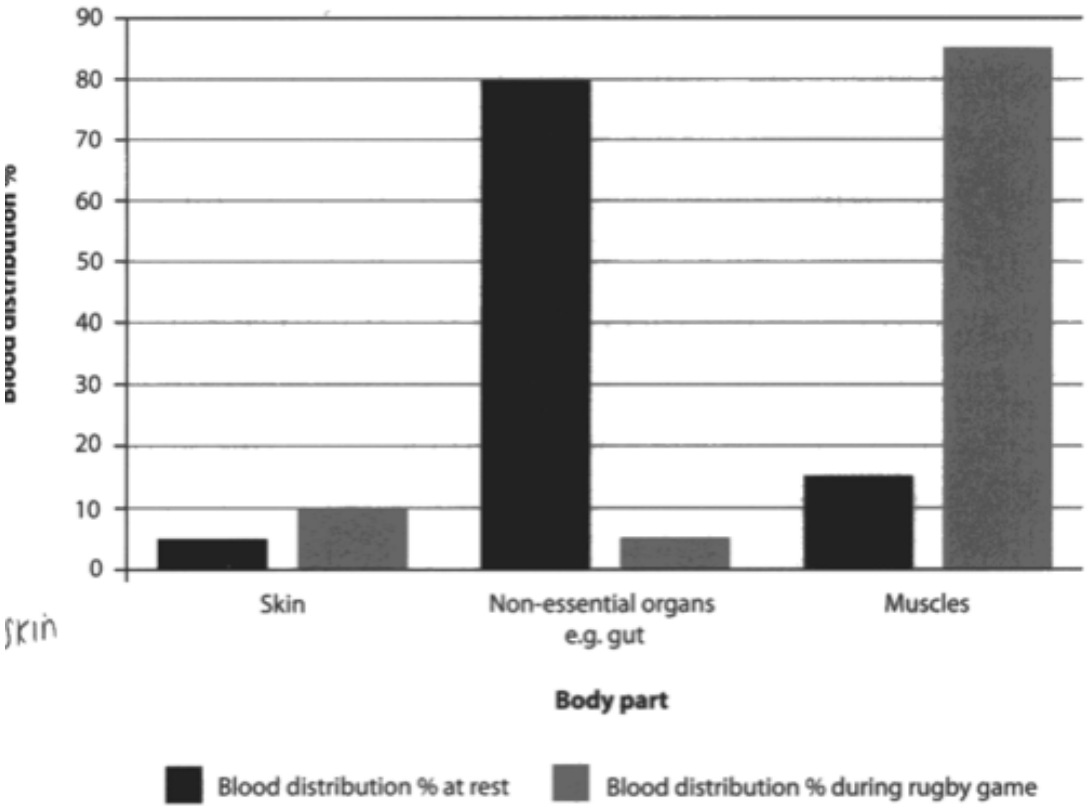
This was the second extended response question of the paper and focused on the redistribution of blood and the impact on rugby performance and indicative content was written according to encompass this knowledge and application.

Like all of the extended response questions, the quality of candidate responses varied. Some candidates were clearly very knowledgeable about the redistribution of blood and the impact on rugby performance, but some candidates struggled to express this in the context of the cardiovascular system.

Level 1 responses used the information in the graph to identify that blood increased/decreased to the different areas, without much expansion towards the impact of this especially on performance and technical terminology was used sporadically. At level 3 candidates charted the effect of the redistribution of blood and the impact on performance, used technical terminology and discussed the impact of the on this on rugby.

This response was placed at Level 3 and given 6 marks. The answer clearly assesses a number of points from the indicative content, focusing on the effects of the redistribution of blood, with effective use of technical terminology, appropriate development in reference to the question was evident, all three areas of the graph were analysed, with clear links to performance evident in the context of the question.

Figure 3 shows Imran's distribution of blood flow at rest and during the rugby game.



skin

Figure 3

(c) Analyse, using **Figure 3**, the changes in distribution of Imran's blood flow to his skin, non-essential organs and muscles when playing rugby.

(6)

At rest, the distribution of blood flow to his skin is approximately @ 5%, as opposed to during the rugby game whereby it is 10%. This is to allow sweat to be released from the skin during exercise to ensure that there is a maintained distribution of heat throughout the body during Imran's rugby game. At rest, the percentage of blood going to the non-essential organs is approximately 20%, and during his rugby game it is approximately @ 5%. During exercise, vasoconstriction occurs so that blood does not go to unnecessary areas such as the digestive system. Vasodilation occurs so that blood goes to the heart and working muscles to ensure that there is a great supply of blood. During rest, there is no demand for blood anywhere in the body, so it is therefore evenly distributed. During rest, the percentage of blood attending the ~~working~~ muscles is approximately 15%, as opposed to during exercise it is 85%. During rest the muscles do not demand oxygen because all the muscles are working equally ~~as he~~ and not forcefully. However, during exercise, Imran demands oxygen within a variety of different muscles over the course of his rugby game to ensure that he is able to work at a high intensity for a long period of time, and receiving enough oxygen. Vasodilation occurs as blood pressure increases to ensure that a great sufficient supply of blood is attending the working muscles. Vasoconstriction occurs so that areas that do not demand blood are not receiving a greater total.

The next section of the paper looked at the energy systems, as anticipated candidates found this section more difficult than other sections and this was reflected within their responses, although this was somewhat improved from the January series.

Q14

This question proved to be a good differentiator, evident through the spread of marks. It was clear that those candidates who understood the process of the electron transport chain scored highly with succient answers. Some candidates found this question difficult to access any of available marks, due to lack of knowledge and understanding. Like all process questions, labelled diagrams are accepted.

This response gained 4 marks

14 Describe the process of the electron transport chain.

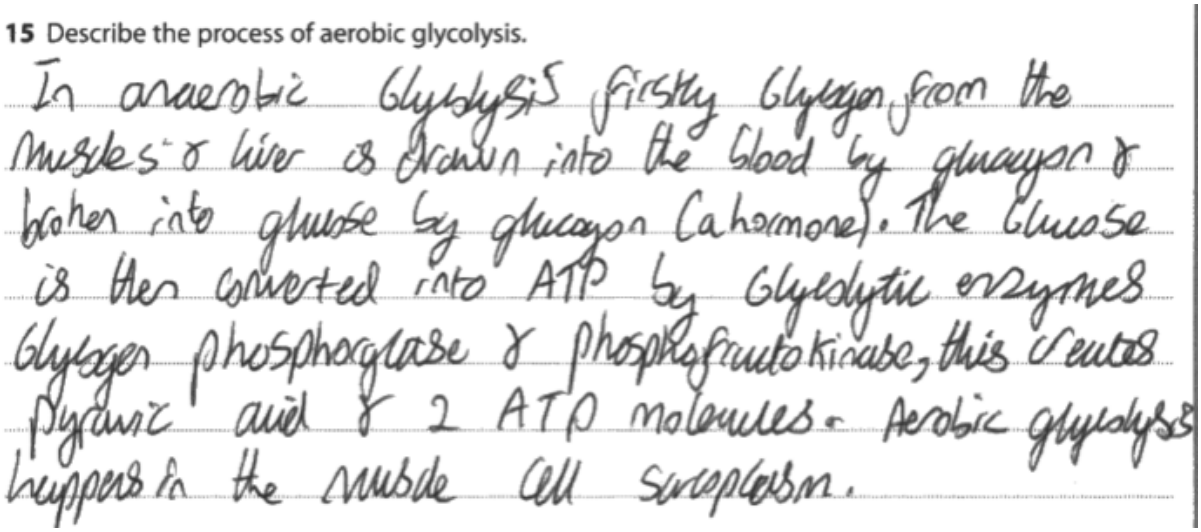
The Electron Transport Chain happens after the Krebs cycle and is one of the importans parts to ~~creating~~ ~~energy~~making energy. It happens in the mitochondria.

The hydrogen (H^+) released from the Krebs cycle is ~~gets~~ taken in by the hydrogen acceptor (NAD), they bond together to make $NADH^+$. This then goes through a series of Redox reaction until eventually 34 molecules of ATP is released. This ATP is ~~taken~~ used by the muscles ~~to be used~~ to create movement. All of this occurs during the aerobic energy system and is the last part of the aerobic energy system.

Q15

Very much like the previous question proved to be a good differentiator, evident through the spread of marks. It was clear that those candidates who understood the process of the aerobic glycolysis scored highly with succient answers. Some candidates found this question difficult to access any of available marks, due to lack of knowledge and understanding. Like all process questions, labelled diagrams are accepted. Common errors were answering a question on anaerobic glycolysis and therefore lactic acid is produced. Nevertheless, positive marking is in place and candidates accessed marks for 2ATP produced and glycogen turned into pyruvate.

This response gained 3 marks


15 Describe the process of aerobic glycolysis.

In anaerobic Glycolysis firstly Glycogen from the muscles or liver is drawn into the blood by glucagon & broken into glucose by glucagon (a hormone). The Glucose is then converted into ATP by Glycolytic enzymes Glycogen phosphorylase & phosphofructokinase, this creates Pyruvic acid & 2 ATP molecules. Aerobic glycolysis happens in the muscle cell sarcoplasm.

Q16

The final question of this section required the candidates to assess the contributions of the energy systems for a tennis player.

Like all of the extended response questions, the quality of candidate responses varied. Some candidates were clearly very knowledgeable about the different energy systems in relation to intensity and duration as well and relating this to performance in tennis. Other candidates were unable to address the question fully and as with the entire section candidates were writing everything they knew about the energy system/s in general rather than answering the specific question.

Level 1 responses came from those candidates who identified it was a high intensity, therefore ATP-PC system was used more. Common mistakes were explaining aerobic

glycolysis, Krebs cycle and electron transport chain, with is irrelevant in the context of the question. Level 3 responses those who assessed the energy systems and articulated them using technical terminology how these contributions are seen within a game of tennis.

This response was placed at Level 2 and given 4 marks. The answer assesses the contribution of the three energy systems, but this is not sustained throughout in relation to intensity, time and example from when it is used in the game.

Andre is an elite tennis player.

Figure 4 shows the contribution of the energy systems during a tennis match.

Energy system	Contribution %
ATP-PC	70
Lactate	20
Aerobic	10

Figure 4

16 Assess the contribution of the energy systems during Andre's tennis match.

(6)

The ATP-PC system has enough energy for up to 10 seconds. During a tennis match the majority of Andre's performance will be high intensity short duration (ATP-PC) e.g. hitting the tennis ball back towards the opponent with power. This is why 70% is the ATP-PC system. The lactate system is 20%, this becomes predominant when the ATP-PC system reduces mostly at 10 seconds. This could be used in Andre's tennis match due to the potential of a continuous rally in which over 10 seconds. Finally the aerobic system is 10% contribution. This aerobic system comes into predominant use after 3 minutes when sufficient oxygen is present. This may be used during Andre's recovery e.g. in between points or waiting for the ball to be served.

Q17

The final question in the paper is a synoptic analysis. I urge centres to read the guidance under AO5 (page 20) of the specification to see the combinations between body systems. This question will always be a maximum of two systems. Candidates should look to synthesise their writing and make connections between the systems where possible demonstrating the inter-relationship.

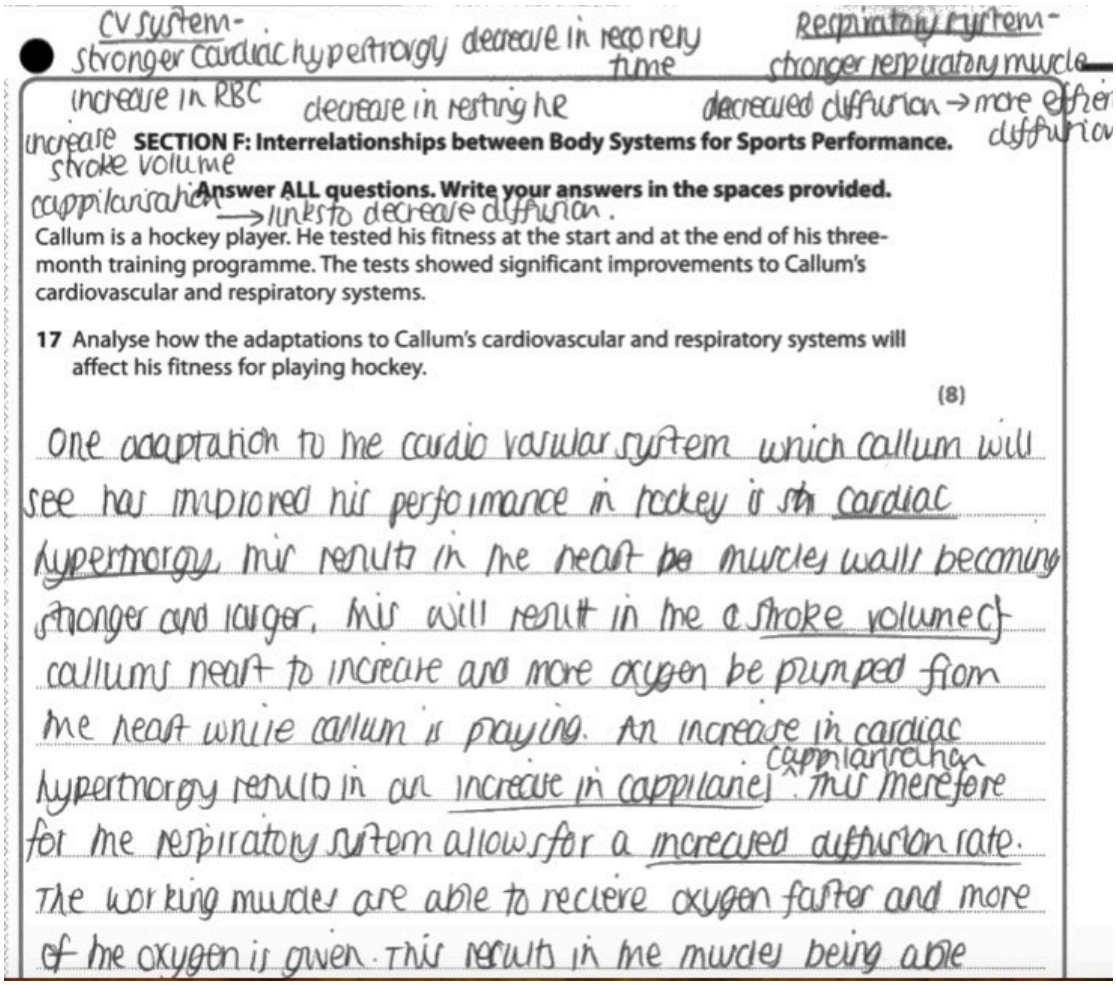
Like all of the extended response questions, the quality of candidate responses varied. Some candidates were clearly very knowledgeable about how the respiratory and cardiovascular systems adaptations work together. Some candidates were unable to address the question fully.

Low level responses demonstrated some knowledge and understanding of the indicative content and often lacked balance or coverage. Common errors were bringing in muscular responses or responses of rest and thus irrelevant in the context of this question.

High level responses displayed synoptic coverage from both areas as well as making link to how these systems work collectively. High-level responses displayed coverage from both areas as well as clearly relating this to hockey performance, rather than using general terms, 'play at a higher intensity for longer, reduce fatigue'.

Level 1 responses tended to focus on isolated elements that make general assertions and did not reference the movement. Level 4 responses provided accurate knowledge of both the respiratory and cardiovascular systems adaptations and the impact this has on fitness for hockey performance. Like any levels of response based question, it is not 1 point equals 1 mark, the indicative content is extensive for candidates to demonstrate a breadth of knowledge and generate credit.

This response below was placed at Level 4 and given 7 marks. The answer clearly analyses the adaptations and how the systems work together. Each system is visited and application to performance and interrelationships are developed throughout.



CV system- stronger cardiac hypertrophy decrease in recovery time increase in RBC decrease in resting HR increase stroke volume capillarisation → links to decrease diffusion.

Respiratory system- stronger respiratory muscle decreased diffusion → more effective diffusion

SECTION F: Interrelationships between Body Systems for Sports Performance.

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

Callum is a hockey player. He tested his fitness at the start and at the end of his three-month training programme. The tests showed significant improvements to Callum's cardiovascular and respiratory systems.

17 Analyse how the adaptations to Callum's cardiovascular and respiratory systems will affect his fitness for playing hockey.

(8)

One adaptation to the cardio vascular system which Callum will see has improved his performance in hockey is the cardiac hypertrophy, this results in the heart the muscles walls becoming stronger and larger, this will result in the stroke volume of callums heart to increase and more oxygen be pumped from the heart while callum is playing. An increase in cardiac hypertrophy results in an increase in capillarisation. This therefore for the respiratory system allows for a increased diffusion rate. The working muscles are able to recieve oxygen faster and more of the oxygen is given. This results in the muscles being able

to work for a longer period of time and the reduction of Co_2 out of the body to increase. Another adaptation to the cardio-vascular system is that will affect his game is the decrease in recovery time. This will therefore result in Callum being able to recover from a shoot in hockey faster then he normally would then due to his callum is able to quickly go back to play the game and use his ability to the best he can without the decrease of oxygen. An adaptation also to the respiratory system that affects an adaptation to the cardio vascular system is the callum having stronger respiratory muscles

this allows callum to ~~breathing~~ decrease his breathing rate and the depth is decreased as the respiratory muscles don't need to work as hard to allow oxygen ~~and~~ in and carbondioxide out. The cardio vascular system as a result of this has a lower resting heart rate. the lungs are able to give more oxygen to the heart to redistribute it around the body in form of the oxid oxiheomoglobin

Summary

Based on their performance on this paper, candidates should:

- Use appropriate technical language throughout their responses,
- Tailor their response based on the command word in the question, e.g. for an explain question there will always be marks available for expansion points and relevance to the scenario.
- Be clear about terminology used in the specification as these words will be repeated in the exam paper, e.g. short-term responses (immediate, due to the exercise/sport), adaptations (long term).
- Only address the correct body system within this section, e.g.in Section A 'The Skeletal System' credit will only be awarded for responses from the specification of the skeletal system. No marks will be available for reference to any other body system.
- I urge Centre's to read the guidance under AO5 (page 20) of the specification to see the combinations between body systems.
- Use the question scenario to demonstrate their ability to apply their knowledge and not write general impacts, but relate this to performance.
- Check their paper carefully for any missed questions and attempt everything.
- Please click here for the specification and SAMS.

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