CAMBRIDGE TECHNICALS

OCR
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CAMBRIDGE TECHNICALS LEVEL 3 (2016)

Examiners' report

SPORT AND PHYSICAL ACTIVITY

05826–05829, 05872

Unit 1 Summer 2022 series

Contents

Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

Where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.

A full copy of the question paper and the mark scheme can be downloaded from OCR.

Unit 1 series overview

Candidates generally found this paper challenging, especially in areas that demanded technical vocabulary and the ability to explain rather than to merely describe. Candidates did well when responding to recall type questions, for example when identifying muscles in Question 13(a). Candidates did less well when responding to questions that required a good working knowledge of applying physiological theories, for example when describing the ATP-PC energy system in Question 19.

Candidates generally wrote clearly and finished the paper set in the time allocated with few requiring additional sheets of answer paper. Some candidates find the spelling of technical words difficult and although examiners make allowances for this if the response shows phonetic similarity, at times this can be a barrier to higher marks, especially in the extended question – Question 21, when the quality of written communication forms part of the assessment for this question.

It is apparent that some centres are covering some aspects of the syllabus less well. This is shown, for example for Question 21, where all candidates from a particular centre left the question on the vascular shunt mechanism unanswered or with irrelevant responses. It is important that centres cover all aspects of the syllabus and that the level of learning is appropriate for this Level 3 qualification. Other centres show that the teaching and learning for this unit has been excellent, with candidates showing the appropriate level of response, using correct technical vocabulary and being accurate in their explanations when required.

Candidates who did well on this paper generally did the following:	Candidates who did less well on this paper generally did the following:
• responded with the depth required for this Level 3 qualification • used appropriate technical vocabulary • answered the extended question (Question 21) fully with clear paragraphs and covering all the variables set out in the question.	• left whole questions unanswered • did not address the requirements of the question and giving irrelevant material in their responses • described rather than explained when a full explanation is required.

Section A overview

This section, including seven multi-choice questions, was generally answered well but many candidates did not give an appropriate value for Question 8 and could not define the term 'cardiac output'. Some candidates gave two responses for a multi-choice question and therefore scored nil marks for that particular question. Those that used a process of methodical elimination (evidenced by some crossing out the incorrect responses) when answering these questions scored well.

Question 1

1 Which one of the following components of blood transports oxygen around the body?

(a) Red blood cells ☐

(b) White blood cells ☐

(c) Arterioles ☐

(d) Plasma ☐

[1]

The vast majority of candidates scored a mark for this straightforward question. The response could have been (a) or (d), but most scored the mark by identifying (a).

Question 2

2 Which one of the following describes the movements possible at the radio-ulnar joint?

(a) Flexion and extension ☐

(b) Medial and lateral rotation ☐

(c) Pronation and supination ☐

(d) Adduction and abduction ☐

[1]

Many identified that the movement at the radio-ulnar joint is pronation and supination (c). Some incorrectly identified (b).

Question 3

3 Which one of the following describes the role of an antagonist muscle?

(a) Muscle that causes movement ☐

(b) Muscle that assists the agonist ☐

(c) Muscle that stabilises a joint ☐

(d) Muscle that opposes movement ☐

[1]

Most candidates identified (d) as the correct role, although some identified (b) incorrectly. Candidates should check which response is technically the most correct when answering the multi-choice questions.

Question 4

4 Which one of the following is **not** a by-product of energy production?

(a) Pyruvic acid ☐

(b) Lactic acid ☐

(c) CO_2 ☐

(d) H_2O ☐

[1]

This proved to be difficult for many candidates, who often indicated the wrong response, for example (d), whereas Pyruvic acid is not a by-product of energy production. Candidates often misread the question, so should be aware that each year it is often the case that a question will ask which one of the possible responses is 'not' applicable.

Question 5

5 Which one of the following carries deoxygenated blood into the right atrium?

(a) Right ventricle ☐

(b) Vena cava ☐

(c) Pulmonary vein ☐

(d) Pulmonary artery ☐

[1]

Most candidates answered this correctly identifying that the vena cava is the one that carries deoxygenated blood into the right atrium.

Question 6

6 Which one of the following is the full name for ATP?

(a) Adrenaline triphosphate ☐

(b) Adrenaline triphosphorus ☐

(c) Adenosine triphosphorus ☐

(d) Adenosine triphosphate ☐

[1]

Many got this question wrong and did not recognise the correct name for ATP, showing a lack of awareness of the required technical vocabulary in this Level 3 syllabus.

Question 7

7 Consider the following statements:

A The patella is a sesamoid bone.
B The scapula is a flat bone.
C Phalanges are short bones.

Which one of the following statements is correct?

(a) **A** and **B** are true. ☐

(b) **A** and **C** are true. ☐

(c) **B** and **C** are true. ☐

(d) **A**, **B** and **C** are true. ☐

[1]

Although some candidates correctly identified (a) as the correct response, many incorrectly thought that phalanges are short bones.

Question 8

8 Give a typical value for breathing frequency at rest per minute.

.....**[1]**

Many candidates identified the correct value from a range of 10-15 breaths.

Question 9

9 Define the term 'cardiac output'.

.....

.....**[1]**

This was not well answered by many candidates, some of which confused cardiac output with a respiratory term – possibly led by the previous question. Candidates are reminded to read each question in Section A as separate/discrete questions.

Assessment for learning

Some candidates did not state in Question 9 that it is the amount of blood being pumped from the heart **per minute**. Candidates are reminded that they should fully state the units of measurement when defining physiological terms.

Question 10

10 Which energy system can break down fats to produce energy?

.....**[1]**

Many candidates identified this as the aerobic system, but some confused this with other systems.

Section B overview

This section includes questions covering the whole range of the syllabus and requires a variety of different responses, including identify questions, descriptions and explanations. Candidates need to be aware of the meanings of these 'command words' because some candidates showed a misunderstanding of what was required by each question. For example, not giving more in-depth responses for explanations.

Question 11 (a)

11 (a) Complete the table to state whether each bone is part of the axial or appendicular skeleton.

Bone	Axial or Appendicular
Ribs	.....
Clavicle	.....
Sternum	.....

[3]

This was answered well by the majority of candidates, although some thought that they were all appendicular.

Question 11 (b)

(b) Describe how the skeleton performs each of the following functions:

Mineral storage .....

.....

Movement .....

.....

Protection .....

.....

Support .....

.....

[4]

Many candidates merely repeated the words in the question rather than giving an explanation. For example, stating that the skeleton gives 'protection' or 'support', instead of describing **how** protection or support is given.

Question 12 (a)

12 Joints are classified according to the amount of movement that they allow.

(a) State the **three** classifications of joint and give an example of each in the human body.

1.....

Example: .....

2.....

Example: .....

3.....

Example:.....

[3]

Many candidates were unaware of the classification of joints and instead gave types of joint, for example 'ball and socket'. Others that scored few marks did not give relevant examples for each classification.

Question 12 (b)

(b) Fig. 12 shows an athlete preparing to throw a javelin.

Fig. 12

Complete the table to identify the type of movement that has occurred to achieve the joint positions shown in **Fig. 12.**

Joint	Joint movement
Right elbow	.....
Right shoulder	.....
Lumbar vertebrae	.....

[3]

This was answered generally well, with most identifying the type of movement at the right elbow being extension. However, many scored few more points, incorrectly identifying the movement at the right shoulder and the lumbar vertebrae.

Question 13 (a)

13 (a) Fig. 13 shows the major skeletal muscles of the body.

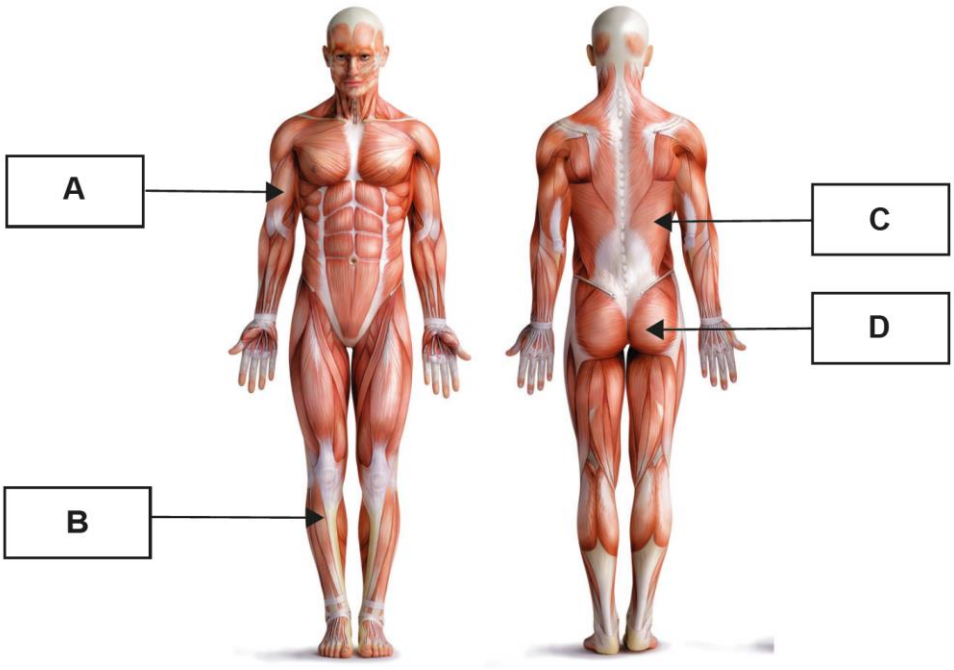

Fig. 13

Identify the muscles labelled **A**, **B**, **C** and **D**.

A .....

B .....

C .....

D .....

[4]

Most scored well on this identify question. Those that scored less well often either left a section unanswered or often gave inaccurate terms. For example, simply writing 'lats' for Latissimus dorsi, or 'glutes' for gluteus maximus is not acceptable at this level.

Question 13 (b)

(b) Describe what happens to a muscle during each of the following types of muscle contraction:

Concentric .....

.....

Isometric .....

.....

Eccentric .....

.....

[3]

This was completed well by most candidates. Note that simply writing 'increase in size' for eccentric or 'decrease in size' for concentric is not accurate enough for this level.

Question 14

14 Describe the effects of a warm up on the muscular system.

.....

.....

.....

.....

.....

.....**[3]**

Most scored at least 1 mark for this question, with those scoring full marks giving separate and accurate points. Those scoring less well often wrote inaccurate statements about the effects of a warmup on the muscular system, such as 'increase in body temperature', instead of increase in the temperature of muscles.

Question 15

15 **Fig. 15** shows the amount of each muscle fibre type in the muscles of two elite athletes.

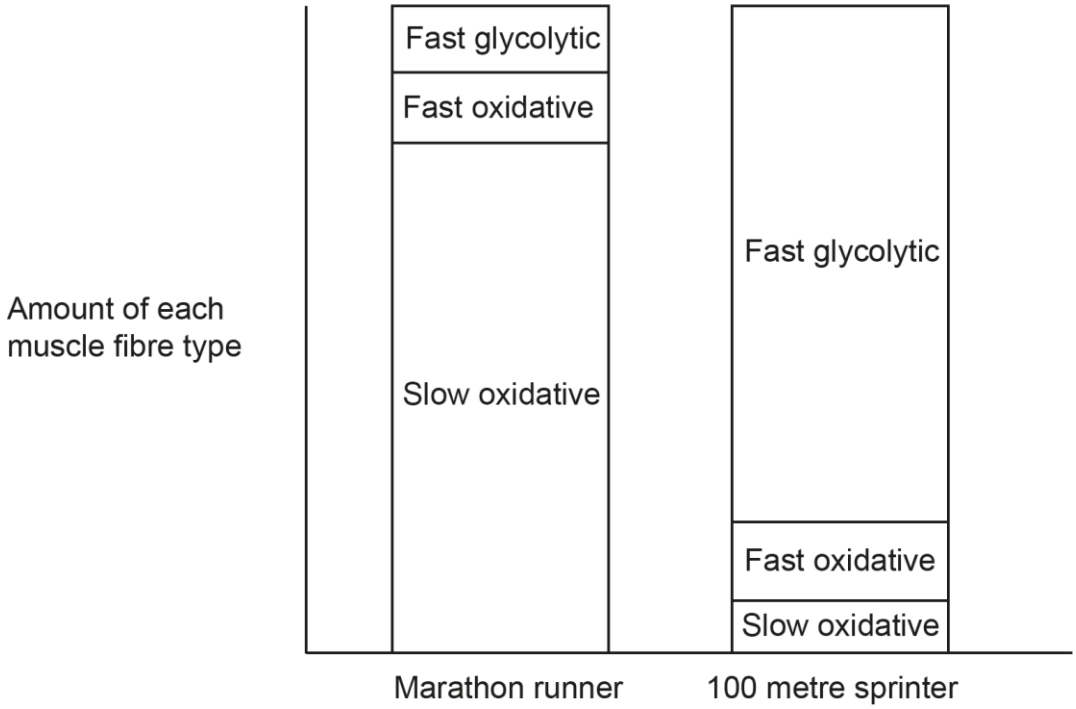

Fig. 15

Explain why the different amounts of each muscle fibre type will help the athletes in their events in **Fig. 15**.

.....

.....

.....

.....

.....

.....**[6]**

This proved to be one of the lowest scoring questions. There are 6 marks available for this question and therefore 6 points (max of 3 marks for marathon and 3 marks for sprinter). Candidates often made only 1 or 2 points or repeated themselves therefore not having access to further marks.

Question 16 (a)

16 **Fig. 16** shows the process of gaseous exchange at one alveolus (air sac) within the alveoli.

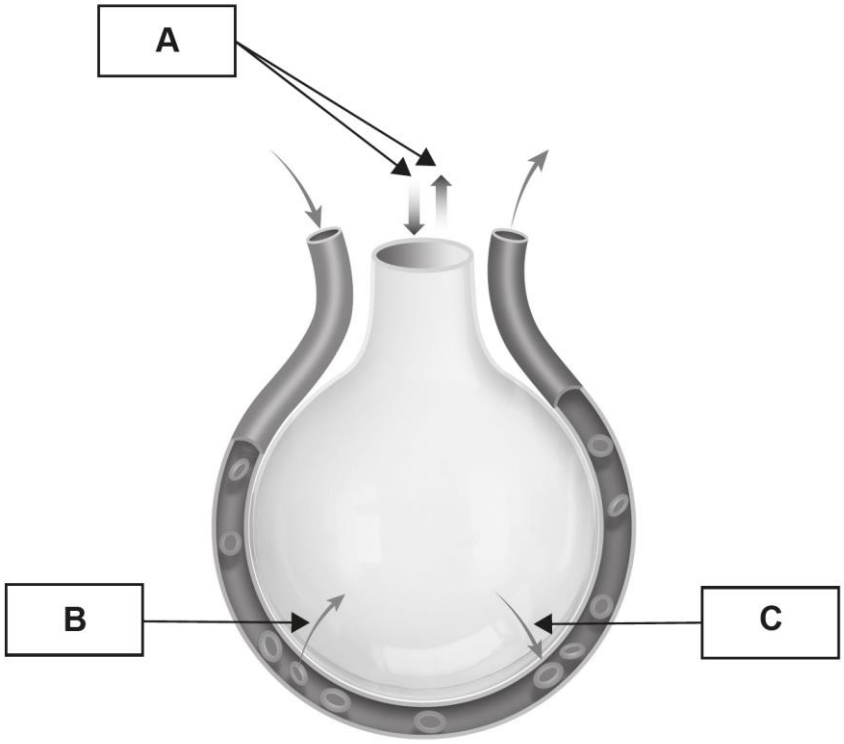

Fig. 16

(a) Identify the gases labelled **A**, **B** and **C**.

A .....

B .....

C .....

[3]

Most scored at least 1 mark for this question. Those that scored 2 marks often incorrectly identified the gases at A as only oxygen and carbon dioxide, whereas 'air' would score the mark given that there are numerous gases that enter from the external environment.

Question 16 (b)

(b) Explain how differences in partial pressures allow gaseous exchange to take place at the alveoli.

.....

.....

.....

.....

.....

.....**[4]**

This was answered well by most candidates, showing a good understanding of gaseous exchange at the alveoli.

Question 17

17 Complete the paragraph below about part of the respiratory system.

Air enters the ..... where mucus membranes ..... the air. It then enters the ..... which is a passage to the larynx and digestive system. The ..... prevents food entering the airways. After passing through the larynx, air enters the ..... which has rings of cartilage that keep the airway open at all times.

[5]

The majority of candidates scored at least 3 marks for this question on the respiratory system. Typical errors included getting the pharynx and the epiglottis the wrong way round.

Question 18

18 Describe the long-term effects of regular physical activity on the following:

Tidal volume .....

.....

Breathing frequency .....

.....

Resting minute ventilation .....

.....

[3]

This was not well answered by the majority of candidates. At this level it is expected that candidates should describe the long-term effects in more detail. For example, by stating that **maximal** tidal volume increases and breathing frequency **at rest** decreases.

Question 19

19 Describe the ATP-PC energy system, also known as the alactic system.

.....

.....

.....

.....

.....

.....

.....

.....**[4]**

Candidates often confused the APP-PC system with other energy systems and therefore scored few marks. Those that scored well fully described it being anaerobic and that one ATP is produced, and that the system lasts for up to 10 seconds.

Question 20

20 The recovery process for each energy system involves different processes and timescales.

Outline **one** process involved in the recovery of the ATP-PC system and state how long it takes for full recovery.

Process .....

.....

Timescale .....

[2]

Many candidates scored at least 1 mark for this question. Some candidates were not aware of how long the system takes for full recovery.

Section C overview

This section includes one extended question worth 10 marks. This is marked using a levels mark scheme that includes credit for the quality of written communication. Very few candidates scored in the top level (8-10 marks), with most scoring Level 1 marks (1-4 marks). This is a section of the syllabus where many students seemed to find difficulty in explaining the vascular shunt process in the detail required for this Level 3 qualification. Those scoring well included all the variables set out in the question and answered with fluency and accuracy, often developing each explanation well.

Question 21

21* Explain how and why blood is redistributed around the body during exercise.

Your answer should include:

- Vascular shunt mechanism
- Role of arterioles
- Role of pre-capillary sphincters.

[10]

This question demanded that candidates explained **how and why** blood is distributed around the body during exercise, including the three variables identified. The most successful candidates made a short plan with points for both how and why, including the roles of the arterioles and the pre-capillary sphincters. These candidates showed detailed knowledge and understanding of the vascular system during exercise and included good use of correct technical language. They included words such as vasodilation and vasoconstriction when explaining the role of the arterioles.

Those that scored less well simply stated that blood goes to the working muscles and away from other 'non-essential' organs. An explanation is required, so these candidates lacked the detail required. For example they did not state that more blood is redirected because the working muscles require more oxygen – thus not including the 'why' as well as the 'how'. For the lower scoring candidates, the 'how' often did not include the action of the pre-capillary sphincters. Some candidates did not attempt this question at all and missed out on a possible 10 marks. Others may not have read the question carefully and simply wrote about the distribution of blood with no relevance to the redistribution linked to exercise.

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