

CAMBRIDGE TECHNICALS LEVEL 3 (2016)

Examiners' report

SPORT AND PHYSICAL ACTIVITY

05826–05829, 05872

Unit 1 January 2021 series

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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.

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Unit 1 series overview

In this examination series, many candidates found Question 13 and Q14 difficult to answer accurately, using appropriate terminology related to muscles and their movements. Many answered Question 16 accurately showing a good understanding of the heart's structure and function.

Most candidates managed their time effectively with very few seemingly running out of time to complete the paper. A few candidates found too many questions unanswerable and did not respond in any form and therefore scored zero marks for those questions. This shows that some candidates were not fully prepared for this examination or that some aspects of the specification had not been covered in the teaching of this unit.

Some candidates misread or did not understand the requirements of the question. For example, in Question 18, candidates were required to define terms and to state values, but some candidates were not accurate in their definitions and did not show the value correctly.

Many candidates showed good knowledge of the structure and roles of the lungs in Question 17, as well as a good understanding of the mechanics of breathing – a topic that has proved difficult to candidates in past examination series.

The extended question (Question 21) was answered well by those candidates who stuck to the requirements of the question related to the cardiovascular system, but too many decided to explain the benefits of physical activity on other body systems which were irrelevant to this question.

The most demanding parts of the paper for many candidates were Questions 3, 4, 9, 14, 15 and 20.

<i>Candidates who did well on this paper generally did the following:</i>	<i>Candidates who did less well on this paper generally did the following:</i>
<ul style="list-style-type: none"> • used accurate technical terminology for muscles and their movements. • read the question carefully for Question 21 and related their answers to the cardiovascular system. • used the correct values in Question 18. 	<ul style="list-style-type: none"> • used generalised non-technical terminology • left too many questions unanswered • did not stick to the requirements of the question.

Section A overview

This largely multi-choice section was mostly answered poorly, with many candidates showing weak knowledge in some aspects of the specification – especially when related to values. Some did not read the question carefully – for example in Question 4 not reading accurately what is required. Question 8 was the best answered question in this section, showing good knowledge of bones.

Question 1

1 Which one of the following muscles causes flexion at the shoulder?

(a) Latissimus dorsi

(b) Deltoid

(c) Pronator teres

(d) Trapezius

[1]

Some correctly identified (b) as the correct muscle causing flexion. Many went for (d) incorrectly.

Question 2

2 Which one of the following is **not** an expected value for cardiac output during exercise?

(a) 5 litres/minute

(b) 10 litres/minute

(c) 15 litres/minute

(d) 20 litres/minute

[1]

Few correctly identified (a) as the incorrect value. Many went for (b) incorrectly.

Question 3

3 Which one of the following statements about gaseous exchange at the alveoli is correct?

(a) In alveoli ppO_2 is high and $ppCO_2$ is high

(b) In alveoli ppO_2 is low and $ppCO_2$ is high

(c) In capillaries ppO_2 is high and $ppCO_2$ is low

(d) In capillaries ppO_2 is low and $ppCO_2$ is high

[1]

Some correctly identified (d) as the correct statement. Many went for (a) incorrectly.

Question 4

4 Which one of the following is **not** a short-term effect of exercise on the muscular system?

(a) Increase in glycogen stores

(b) Increase in lactic acid

(c) Increase in blood flow

(d) Decrease in phosphocreatine

[1]

The minority correctly identified (a) as the incorrect effect. Many went for (d) incorrectly.

Question 5

5 What type of bone is the patella?

(a) Flat

(b) Short

(c) Sesamoid

(d) Irregular

[1]

Many correctly identified (c) as the correct type of bone. Some went for (b) incorrectly.

Question 6

6 Which one of the following blood vessels carries blood at the lowest pressure?

(a) Arteries

(b) Arterioles

(c) Venules

(d) Veins

[1]

Some correctly identified (d) as the correct vessel. Many went for (c) incorrectly.

Question 7

7 Which one of the following is **not** a fixator muscle during a biceps curl?

(a) Deltoid

(b) Triceps brachii

(c) Trapezius

(d) Teres major

[1]

Many correctly identified (b) as the correct fixator muscle. Some went for (a) incorrectly.

Question 8

8 Which one of the following bones is part of the appendicular skeleton?

(a) Sternum

(b) Scapula

(c) Cranium

(d) Coccyx

[1]

Most correctly identified (b) as the correct bone.

Question 9

9 State the long-term effect of regular exercise on maximum minute ventilation.

.....[1]

Some candidates did not understand question so their responses referred to changes to other factors.

Question 10

10 Identify **one** of the three stages of the aerobic system.

.....[1]

This was answered accurately by many candidates but some identified stages from the wrong system.

Section B overview

This section required mostly short but accurate answers. Many candidates misread questions and gave irrelevant answers, for example in Question 15. Many candidates showed a good understanding of anatomical structures such as the vertebral column. Weaker responses were associated more with functional rather than structural questions, although the function of the vertebral column was answered well. Question 21 does require a more extended response that many candidates answered well but many did not give enough information to score the 10 marks available and often did not address all the aspects of the question.

Question 11 (a)

11 Fig. 11 shows an image of the vertebral column.

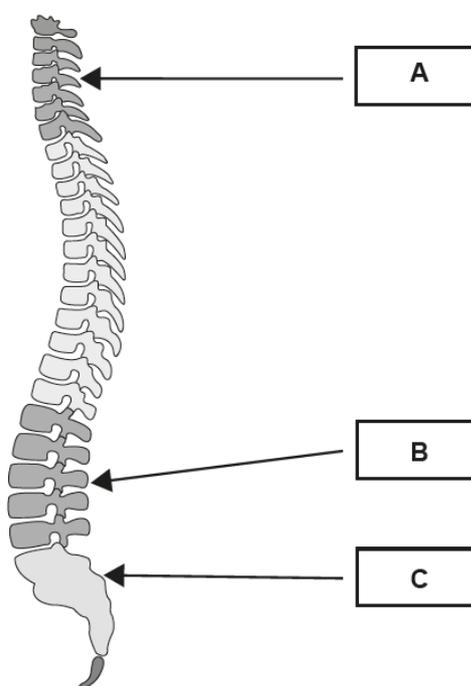


Fig. 11

(a) Identify the sections of the vertebral column, labelled A, B and C.

A

B

C

[3]

This was mostly answered accurately, although many mixed up sacrum with the coccyx for C.

Question 11 (b)

(b) Describe **two** functions of the vertebral column.

- 1.....
-
- 2.....
-

[2]

This was answered very well by most candidates.

Question 12 (a)

12 Fig. 12.1 shows an image of a synovial joint.

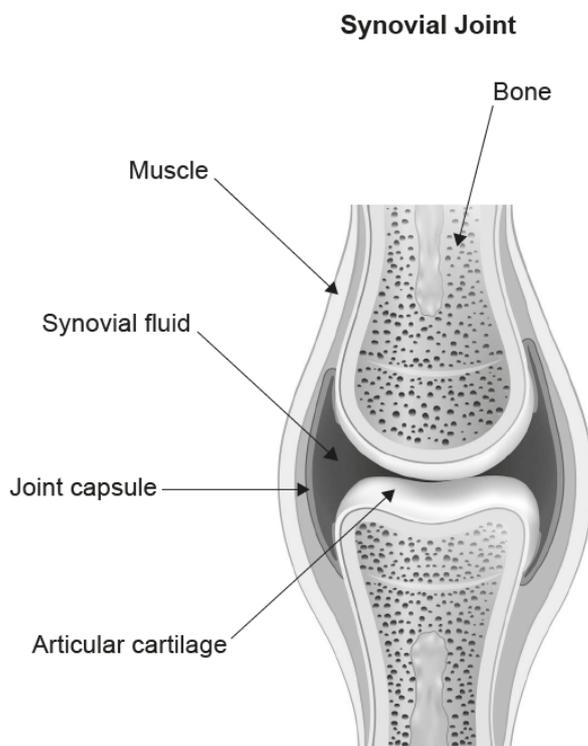


Fig. 12.1

(a) Describe the functions of the following structures of a synovial joint.

- Synovial fluid
-
- Joint capsule.....
-

[2]

Most gave an accurate answer for synovial fluid but many incorrectly answered for the joint capsule.

Question 13

13 Complete the table below to identify the joint movements described.

Movement	Description	Practical example
.....	Increasing the angle at a joint.	Movement at elbow while throwing a ball.
.....	Moving a limb towards the mid-line of the body.	Movement at shoulder as arms move down during a star jump.
.....	Bending the spine to the side.	Movement at spine while bowling in cricket.
.....	Rotating a limb outwards about its longitudinal axis.	Movement at hip to perform a side-footed pass in football.
.....	Rotating the radio-ulnar joint so that palm faces upward.	Turning the hand to throw a ball underarm.

[5]

This caused candidates problems, with many either incorrectly identifying movements sections 3 and 4 or leaving these blank. Candidates seemed to have difficulty identifying lateral flexion and lateral rotation.

Question 14

14 Fig. 14 shows the performance of a sit up.



Fig. 14

Complete the paragraph below to explain how muscles function during a sit up.

During the upward phase of the sit up, the agonist is the
muscle.

The type of contraction in this muscle is

The antagonist muscle is the

If the performer holds their position still for a time before the downward movement the
type of contraction in the working muscle is

During the downward phase the agonist is the
muscle.

The type of contraction in this muscle is

[6]

This was answered well by a minority of candidates who showed a good understanding of muscle function and could apply this to a physical movement. Many, however, could not identify muscle types using the correct terminology – for example simply using the term abdominals for rectus abdominus. For this level, candidates are expected to name specific muscles that are in the specification.

Question 15 (a)

15 Fig. 15 shows the order of muscle fibre use as exercise intensity increases.

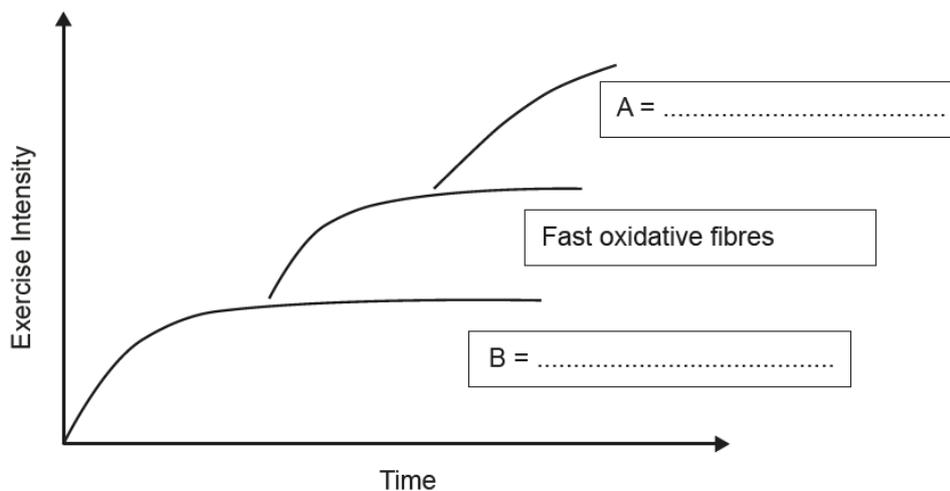


Fig. 15

(a) Label the muscle fibre types A and B in the boxes on the diagram.

[2]

Most recognised the correct order of fibres, although some got the types the wrong way round.

Question 15 (b)

(b) Explain how increasing the intensity of exercise affects muscle fibre type use.

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

This proved to be the weakest answered question on the paper, with many candidates not recognising that at medium/higher intensity FOG **and** slow twitch fibres are used and at high intensity **all** of the muscle types are used.

Question 16 (a)

16 Fig. 16 shows a diagram of the heart.

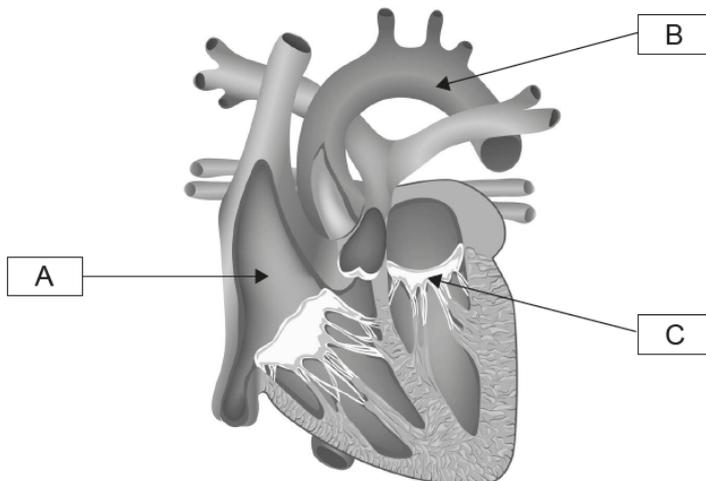


Fig. 16

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

A.....
B.....
C.....

[3]

Most candidates answered this structural question correctly, showing a good understanding of the structure of the heart.

Question 16 (b)

(b) Explain the functions of B and C.

B.....
.....
C.....
.....

[2]

Again, mostly well answered, although some became confused about the function of B or did not fully show the function of C.

Question 17 (a)

17 (a) Complete the table below describing the structures of the lungs and their roles.

Structure of lungs	Role
.....	Branch off from the trachea to the left and right lungs.
Alveoli	Sites where gaseous exchange takes place.
.....	Warms, moistens and filters air from the atmosphere.
Epiglottis

[3]

Most scored well for this question showing good knowledge of the structure of the lungs and their roles.

Question 17 (b)

(b) Complete the paragraph below which describes the mechanics of breathing during expiration.

The diaphragm and the external intercostal muscles

The internal intercostal muscles

This causes the ribs to move

The volume of the thoracic cavity

This means that pressure in the lungs

As a result, air is forced out of the lungs.

[5]

This has traditionally been a difficult topic area for candidates, but for this series many candidates answered this accurately showing an increased awareness of the mechanics of breathing.

Question 18

18 Define the following terms, and state an average resting value for each.

Breathing frequency.....

.....

Average resting value

Tidal volume.....

.....

Average resting value

[4]

Although most candidates could define the terms, many could not give accurate values and associated units.

Question 19

19 Fig. 19 shows a flow chart to represent the lactic acid system.

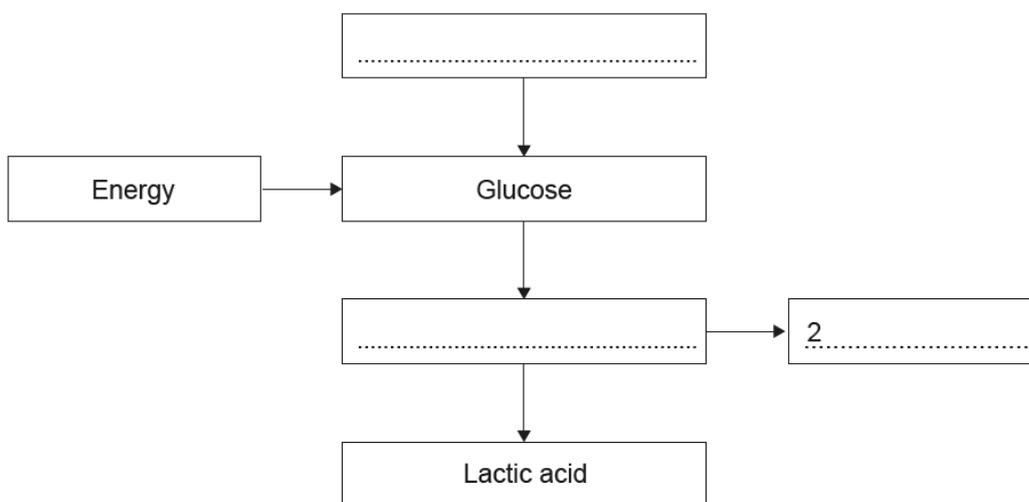


Fig. 19

Complete the flow chart by filling in the missing words.

[3]

Mostly answered well, although some left this question out unanswered.

Question 20 (a)

20 Fig. 20 is a bar chart showing the contribution of different energy systems for a marathon runner and a games player. The games player's bar is incomplete.

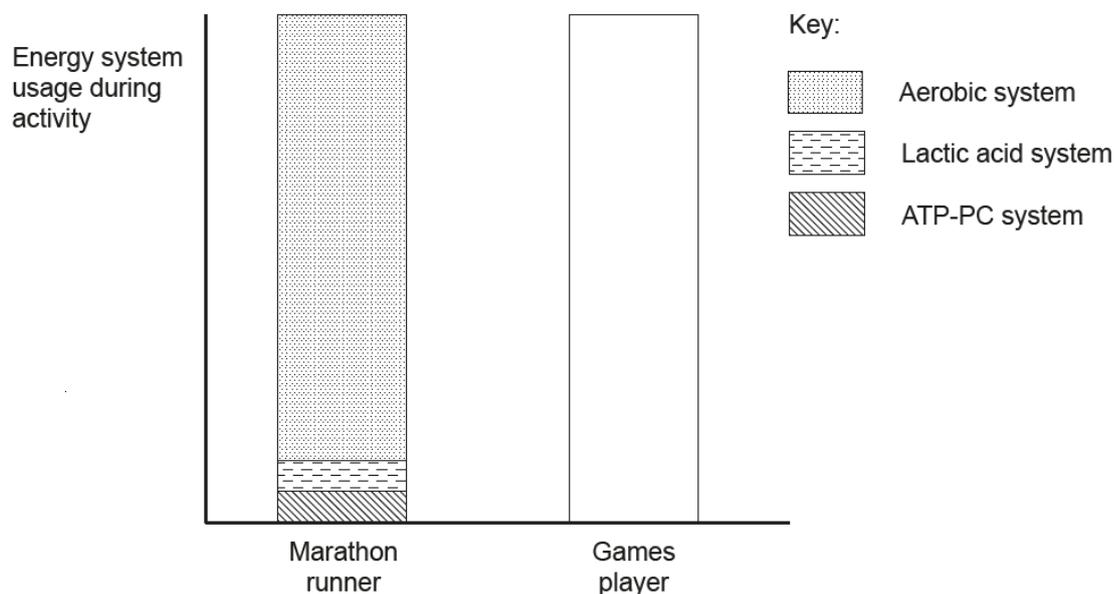


Fig. 20

(a) Identify a games activity of your choice below, and indicate on the bar chart the energy system usage of a player in that game.

Game.....

[1]

Most candidates could indicate the appropriate usage on the graph, but a minority of candidates gave the name of an athletics event such as the 800m race and so scored zero marks for the whole question.

	AfL	Candidates should be reminded to read each question carefully and to give an appropriate physical activity when required.
-------------------------------------------------------------------------------------	------------	---------------------------------------------------------------------------------------------------------------------------

Question 20 (b)

- (b) Using the same games activity from 20 (a), describe a practical situation that would predominantly use the following energy systems:

ATP-PC system

.....

.....

Lactic acid system

.....

.....

Aerobic system

.....

.....

[3]

Those that gave an appropriate game activity could then score for this part of the question, although many only scored a single mark for their practical situation related to the ATP-PC system. The other two systems were less well understood with inaccurate practical situations given that did not exemplify the intensity of the activity.

Question 21*

21* The cardiovascular system consists of the heart, the blood vessels and the blood.

Explain the long-term benefits and potential negative impacts of physical activity on the cardiovascular system.

[10]

.....

.....

.....

.....

.....

.....

This 10 mark question is marked using a levels response mark scheme with descriptors that help examiners to pinpoint a mark from the responses they read.

Only a small minority of candidates answering this question were given zero marks for this series.

This extended question also assesses the quality of written communication. The better responses had very few spelling errors and had clear sentences, divided well into distinguishing paragraphs. Weaker responses again showed poor planning and poor accuracy in spelling.

The best responses took note of the command word in the question - 'explain' - and went beyond simple descriptions. These candidates stuck to the cardiovascular system rather than other body systems and they also referred to the heart, the blood vessels, and the blood as the stem of the question refers to.

Weaker responses referred to other systems such as muscles or they only answered the question related to the heart and little else.

The question does also relate to 'potential negative impacts' – stronger responses identified these negative impacts such as over-exercising putting strain on the heart and explained these well. Many candidates ignored the request for negative impacts or were very sketchy in their responses and did not fully explain.

These extended questions often have different variables to address in the answer. The better candidates planned their answer to explain these variables – the benefits to the heart, the blood vessels and the blood and then the negative impacts. These candidates wrote clearly using separate paragraphs and could use the appropriate technical vocabulary expected for the Level 3 unit.

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QP 12(b) Fig. 12.2 - Shoulder and hip ball and socket joints – ©Shutterstock 492413887 By Puwadol Jaturawutthichai

Q14, Fig. 14 – Sit ups - ©Shutterstock 715195228 By solar21

Q16, Fig. 16 – Heart - ©Shutterstock 347365283 By Elen Bushe

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