

## **CAMBRIDGE TECHNICALS LEVEL 3 (2016)**

*Examiners' report*

# ***SPORT AND PHYSICAL ACTIVITY***



**05826–05829, 05872**

## **Unit 1 Summer 2019 series**

Version 1

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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 can be downloaded from OCR.

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## Paper Unit 1 series overview

In this examination series, most candidates were generally well prepared for questions on most aspects of the specification, although many candidates found Question 20 on gaseous exchange difficult to answer accurately.

Most candidates managed their time effectively with only a few seemingly running out of time to complete the paper.

Some candidates are again not identifying clearly the requirements of each question and so are scoring less well. For example, in Question 14b, candidates were asked to explain how different intensities of exercise determine muscle fibre types used by a sports performer. Many scored low marks because they had misunderstood the concept of differing intensities and just wrote about a single

Candidates showed improved preparation in analysing data and drawing appropriate graphs and many scored well in Question 15a.

The extended question (Question 21) was well answered by many candidates and showed good planning for their description and explanation. Most now realise that all variables in this extended question should be answered to gain access to the higher mark bands.

The most demanding parts of the paper for many candidates were Questions 6, 9, 14b, 15b, 18 and 20.

## Section A overview

This section is largely made up of multi-choice single mark questions from all areas of the specification. Candidates scored well when they carefully assessed the requirements of each question but some misread questions, for example Question 4 - which one of the following does **not** act at the hip joint and Question 7 - which of the following statements.... is **incorrect**. Some candidates did not give the full name of the structure in Question 9 and did not give units for their calculation in Question 10.

### Question 1

1 Which of the following athletic events relies predominantly on the lactic acid energy system?

(a) 400 m hurdles

(b) 1500 m

(c) 100 m

(d) Triple jump

[1]

Many correctly identified (a) as the correct event with the most common mistake being (d).

### Question 2

2 Which of the following are bones which form part of the appendicular skeleton?

(a) Sternum and femur

(b) Humerus and ribs

(c) Scapula and clavicle

(d) Sternum and ribs

[1]

Some correctly identified (d) as the correct bones, although many showed lack of knowledge of the appendicular skeleton.

### Question 3

3 Which of the following is the joint type found between the lumbar vertebrae?

(a) Fused

(b) Condyloid

(c) Saddle

(d) Gliding

[1]

Many correctly identified (d) as the correct joint type with the most common mistake being (c).

### Question 4

4 Which of the following muscles does **not** act at the hip joint?

(a) Adductor longus

(b) Teres major

(c) Gluteus medius

(d) Iliopsoas

[1]

Most correctly identified (b) as the correct muscle, with the most common mistake being (d).

## Question 5

5 Which of the following muscle fibre types would be most beneficial for a shot putter?

(a) Slow oxidative

(b) Fast oxidative

(c) Slow glycolytic

(d) Fast glycolytic

[1]

Some correctly identified (d) as the correct type with the most common mistake being (b).

## Question 6

6 Which of the following is the correct timescale for the restoration of phosphocreatine stores?

(a) 20 – 30 seconds

(b) 2 – 3 minutes

(c) 20 – 30 minutes

(d) 1 – 2 hours

[1]

Relatively few correctly identified (b) as the correct timescale.

## Question 7

7 Which of the following statements about the structures of the respiratory system is **incorrect**?

(a) The trachea branches off into the left and right bronchi

(b) Bronchioles contain smooth muscle and no supporting cartilage

(c) The pharynx is also known as the voice box

(d) The epiglottis prevents food from entering the trachea

[1]

Most correctly identified (c) as the incorrect structure, with some misreading incorrect as correct.

### Question 8

8 Which of the following is the correct order of blood flow through a section of the heart?

(a) Right atrium – right ventricle – tricuspid valve – pulmonary artery

(b) Right atrium – left atrium – left ventricle – right ventricle

(c) Right atrium – bicuspid valve – left atrium – left ventricle

(d) Right atrium – tricuspid valve – right ventricle – pulmonary artery

[1]

Most correctly identified (d) as the correct order with the most common mistake being (a).

### Question 9

9 Name the structure that regulates the flow of blood into the capillaries.

.....[1]

This proved difficult for many candidates who did not know the full term for this structure or who left this question unanswered.

### Question 10

10 Calculate the minute ventilation of an individual with a breathing frequency of 20 breaths per minute and a tidal volume of 700 ml.

.....[1]

Although many now realise that units must be included in any answer to a calculation question, there is still a sizeable minority who are not including the units or who use incorrect units.



## Section B overview

This section is made up of short and longer answered questions from 2 - 7 marks. The mark for each question in this section is an indication of how many separate valid points the candidate should make in their response.

### Question 11

11 Fig. 11.1 shows an image of a skeleton.

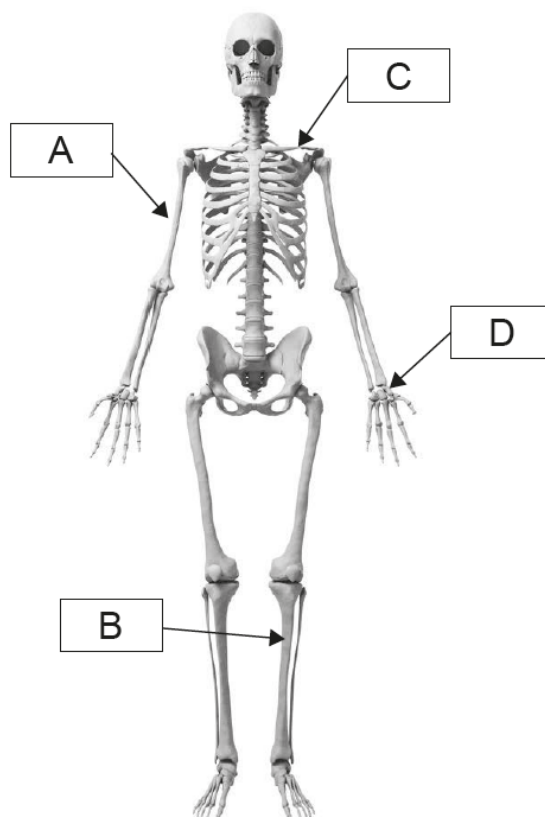


Fig. 11.1

Identify the bones labelled A, B, C and D.

A .....

B .....

C .....

D .....

[4]

Most candidates could label the diagram accurately, with a minority of candidates mixing up tibia with fibula or incorrectly identifying structure D (carpals).

## Question 12

- 12 The following paragraph describes the functions of the skeleton. Complete the paragraph by filling in the missing words.

The skeleton is created to perform several functions. It protects vital ....., for example the ..... protects the brain.

Long bones also manufacture ..... in their ..... These bones also provide a useful store of .....

The skeleton is jointed to allow ..... and also gives the body ..... and support.

[7]

This was completed accurately by a majority of candidates showing good understanding of the function of the skeleton.

### Question 13 (a)

13 Fig.13.1 shows a performer in the upward position of a bench dip.



Fig. 13.1

(a) Identify the joint positions at the hip, knee and elbow.

Hip .....

Knee .....

Elbow .....

[3]

Most candidates scored the full 3 marks for this movement analysis question.

### Question 13 (b)

(b) Complete the table below for the elbow during the **downward** phase of the bench dip.

Muscle function	Muscle acting	Type of contraction
Agonist	.....	Eccentric
Antagonist	.....	.....
.....	Erector spinae	.....

[5]

Many candidates got the agonist and antagonist confused, but most scored well on muscle function and types of contraction.

### Question 14 (a)

14 Fig. 14.1 shows a butterfly swimmer in action.

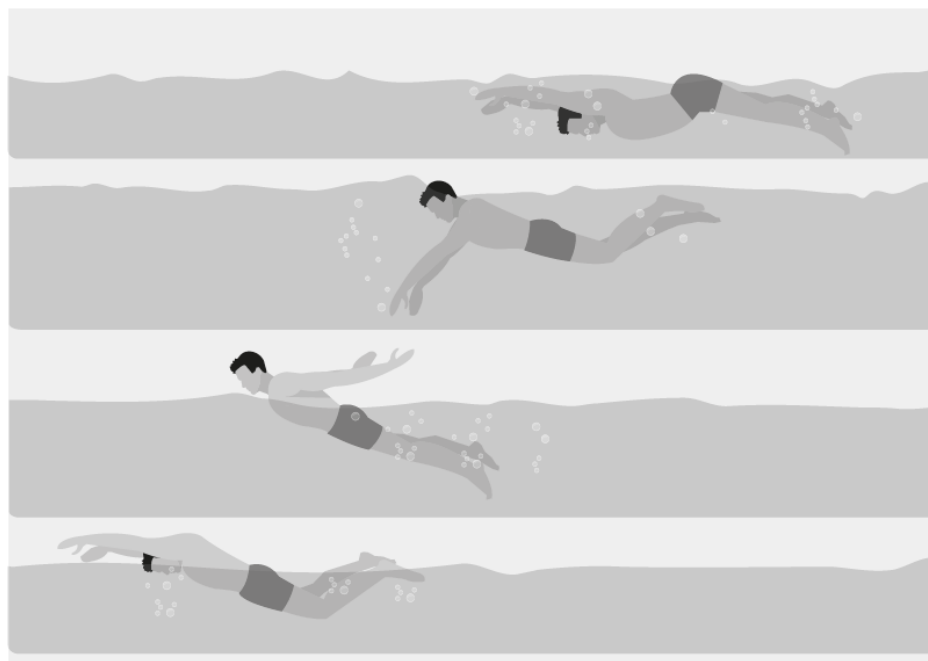


Fig. 14.1

(a) Name **three** muscles that act at the shoulder joint to assist the arm action of the swimmer during the butterfly stroke.

- 1.....
- 2.....
- 3.....

[3]

This type of question has proved difficult for candidates in past series, but many could identify at least two appropriate muscles. Those that scored low marks often incorrectly identified triceps brachii or biceps brachii or used inaccurate labels – for example ‘pecs’ for the pectorals or ‘traps’ for trapezius. At this level candidates should know the correct terminology for muscles included in the specification.

### Question 14 (b)

(b) Explain how different intensities of exercise will determine which muscle fibre type will be used by a performer in a sporting activity of your choice.

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

This was poorly answered by many candidates who misread the question and merely explained only one muscle fibre type. Some candidates only gave examples which highlighted the intensities. Slow oxidative was normally correctly identified, but some confusion was shown.

### Question 14 (c)

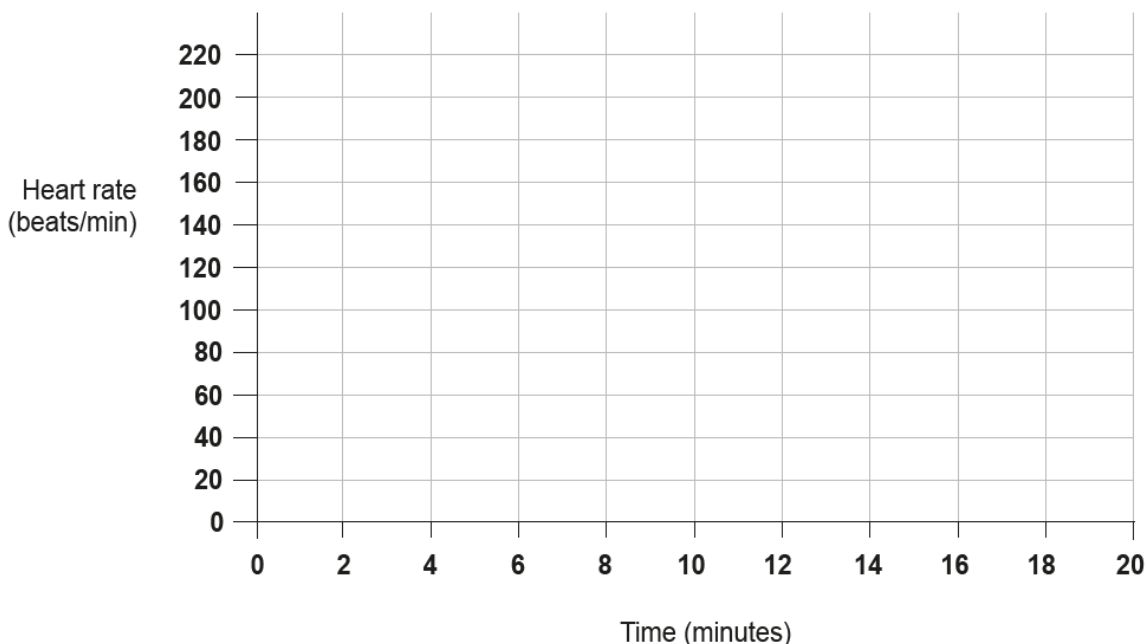
(c) Describe **two** negative short-term effects of exercise on the muscular system.

.....  
.....  
..... [2]

This was answered well by the majority of candidates, scoring the full 2 marks and showing a good understanding of short-term effects of exercise.

### Question 15 (a)

- 15 (a) Sketch a line graph, using the grid below, to show the heart rate of a 20-year old individual who runs for 17 minutes at a steady pace on a treadmill, and then runs as fast as possible for the final 3 minutes.



[4]

The interpretation of data and the drawing of graphs has proved difficult for candidates in past series, but more candidates were better prepared showing a good understanding of heart rate patterns. Others were less well prepared and often incorrectly identified the heart rate at zero minutes and showed an inaccurate plateau or excluded a plateau altogether.

### Question 15 (b)

- (b) Explain why the stroke volume of a trained athlete differs from the stroke volume of an untrained individual.

.....  
.....  
.....  
.....  
.....  
.....

[3]

Most scored at least 1 mark showing some knowledge of stroke volume. To gain 3 marks, candidates need to make three valid points - many only gave one or two.

### Question 16

16 Complete the table below to identify the blood vessels described.

Blood vessel	Description
.....	Receive blood from the capillaries at low pressure.
.....	Carry blood under the highest pressure. Their walls extend and recoil under this pressure.
.....	Contain pocket valves to assist blood flow.

[3]

Candidates scored low for this question, showing significant gaps in knowledge of blood vessels. Many scored a single mark for correctly identifying arteries but then few identified the appropriate blood vessel for the remaining two descriptions.

### Question 17

17 Describe the function of platelets and red blood cells.

Platelets .....

.....

Red blood cells.....

.....

[2]

The vast majority candidates scored the full 2 marks for this question. Those who scored less often wrote 'scabs' for clotting, which is not a term accepted at this level for the function of platelets.

### Question 18

- 18 During exercise additional muscles are used to increase tidal volume, helping a performer breathe more deeply.

Explain how the contraction of the following muscles assists this process.

Sternocleidomastoid

.....  
.....  
.....  
.....

Rectus abdominus

.....  
.....  
.....  
.....

[4]

The mechanics of breathing has often been a topic in past series that proved difficult for candidates and this year showed some improvement but there were still gaps in the knowledge of candidates related to the actions of these muscles.

### Question 19

- 19 Describe the changes in tidal volume during recovery after exercise.

.....  
.....  
.....  
.....

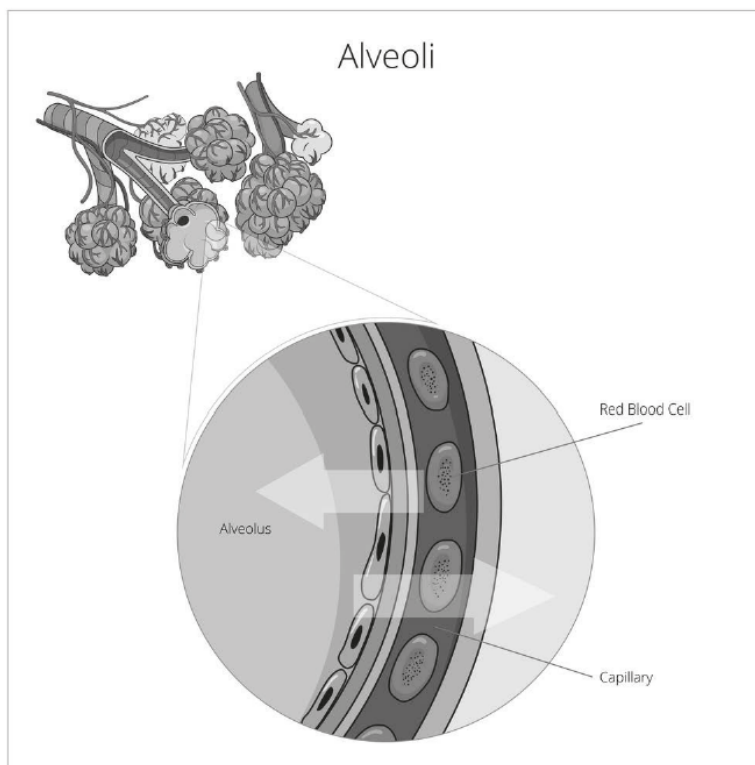
[2]

Otherwise candidates showed a good understanding of the changes in tidal volume.



## Question 20

20 Fig. 20.1 shows an image of the capillary networks at the alveoli.



**Fig. 20.1**

Explain the process of gaseous exchange at the alveoli by comparing the partial pressures of oxygen and carbon dioxide in the alveoli and the capillaries.

.....  
.....  
.....  
.....  
.....  
.....  
.....[5]

This question proved to be the most demanding for many candidates. Those that scored few marks tended to get confused with high partial pressure and low partial pressure both in the alveoli and the capillaries. These same candidates often also showed confusion over the destination of diffused oxygen and carbon dioxide. The better candidates were able to explain the process in full and often scored full marks.

## Section C overview

This section is an extended question for 10 marks and candidates need to show knowledge and then develop each knowledge point. For example they could include glycolysis and then describe that it produces 2 ATP.

This section is marked using a levels mark scheme that includes credit for the quality of written communication. This series, the quality of written communication was improved with candidates often carefully planning their response and writing coherently and accurately using valid terminology when required. Some lower scoring candidates either left this question unanswered or simply wrote bullet points that rarely described fully the aerobic energy system or explained why it provides the majority of the energy needed in a marathon race.

### Question 21

**21\*** A marathon runner relies predominantly on the aerobic energy system during a race.

Describe the aerobic energy system and explain why it provides the majority of the energy needed during the race.

**[10]**

This ten-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 very small minority of candidates were given zero marks for this question again for this series.

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

Many candidates were able to identify stages of the aerobic system, along with the appropriate amount of ATP produced. The most able candidates also identified that other systems are used at some points during the marathon. With weaker responses, a deeper understanding of the stages was lacking with only superficial points made. The intensity and duration of the marathon was usually discussed by the better candidates. Most candidates discussed both the stages and the demands of the event to some degree, with the most able making their point and then developing it to show a detailed knowledge and understanding of the aerobic system.

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