OCR
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CAMBRIDGE TECHNICALS LEVEL 3 (2016)

Examiners' report

SPORT AND PHYSICAL ACTIVITY

Cambridge TECHNICALS

Unit 1 January 2019 series

Version 1

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, lower ability 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.

Unit 1 series overview

In this examination series, many candidates seemed generally well prepared for questions on most aspects of the specification, although a high number of candidates found question 14 on movement analysis difficult to answer accurately. It was noted that previous difficulties candidates have had with mechanics of breathing, are now better prepared for related questions such as question 18b.

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

Some candidates are not identifying clearly the requirements of each question and are therefore scoring less well. For example, in question 13a candidates are asked to identify structural characteristics, whereas the lower ability candidates gave answers that were functional rather than structural.

The amount of marks given in each question, apart from question 21, is usually a good indication of the number of points to be made and so candidates should ensure that enough material is given in each responses to gain access to all the marks available.

The extended question was generally well answered by many candidates, although some candidates did not refer to all the variables identified in the question and therefore did not have access to the higher marking levels.

The most demanding parts of the paper for many candidates were questions 4, 6, 7 (note the use of '**not'** in the question), 14 and 20.

Section A

Question 1

1 Which of the following bones form the ankle joint?

(a) Femur, tibia and fibula ☐

(b) Talus, tarsals and metatarsals ☐

(c) Talus, tibia and fibula ☐

(d) Tibia, talus and tarsals ☐

[1]

Many candidates got this right, but some were unsure about the structure of the ankle joint.

Question 2

2 Which of the following types of bone are the phalanges?

(a) Long ☐

(b) Short ☐

(c) Irregular ☐

(d) Sesamoid ☐

[1]

Many candidates responded well but those who responded incorrectly often selected short rather than long.

Question 3

3 Which of the following structures surrounds and encloses a synovial joint?

(a) Synovial membrane ☐

(b) Joint capsule ☐

(c) Hyaline cartilage ☐

(d) Bursae ☐

[1]

Many candidates incorrectly put synovial membrane instead of joint capsule.

Question 4

4 Which of the following is **not** an example of an isometric contraction?

(a) 'Set' position in sprinting ☐

(b) Handstand in gymnastics ☐

(c) 'Take the strain' in tug-of-war ☐

(d) Smash in badminton ☐

[1]

Some candidates did not recognise that the question is asking for one that is **not** an example – candidates are advised not to rush these multiple choice questions and to read each question and each option at least twice before answering.

Question 5

5 Which of the following is a characteristic of fast glycolytic muscle fibres?

(a) Low phosphocreatine stores ☐

(b) Few mitochondria ☐

(c) Many capillaries ☐

(d) High myoglobin stores ☐

[1]

This was done less well by many candidates, with a misunderstanding evident between different muscle fibres.

Question 6

6 'Sporting activities can be placed at different points on this depending on their intensity and duration.'

Which of the following does the statement refer to?

(a) Movement analysis ☐

(b) Energy system ☐

(c) Energy continuum ☐

(d) Recovery process ☐

[1]

This was not responded well by many candidates who often confused energy system with energy continuum.

Question 7

7 Which of the following is **not** a long-term effect of regular exercise?

(a) Muscle hypertrophy ☐

(b) Increased capillarisation ☐

(c) Increased blood pressure ☐

(d) Increased stroke volume ☐

[1]

Some candidates did not notice the word **'not'** in the question, but many responded correctly to this one.

Question 8

8 Which of the following muscles does **not** assist in the mechanics of breathing?

(a) Scalene ☐

(b) Pectoralis minor ☐

(c) Diaphragm ☐

(d) Adductor brevis ☐

[1]

This has traditionally been a weak area of knowledge, but many candidates got this right, although some incorrectly identified scalene.

Question 9

9 Calculate the breathing frequency of an individual with a tidal volume of 500 ml and a minute ventilation of 6000 ml/minute.

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

Although many completed the calculation correctly, some of these were unable to score a mark because they did not give the units involved – in this case breaths per minute. Some candidates were unable to accurately complete the calculation. Candidates are reminded that any calculation should include an accurate statement of units involved.

Question 10

10 Name the component of blood that transports nutrients and hormones.

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

This was identified correctly by many, although some candidates incorrectly identified red blood cells or haemoglobin.

Section B

Question 11

11 Identify **three** functions of the skeleton, other than shape and movement.

1 .....

2 .....

3 .....

[3]

This was answered very well by most candidates, often scoring all the marks available. Some candidates did not read the whole question and gave shape and movement in their answer when clearly the question states 'other than'.

Question 12

12 **Fig. 12.1** shows some major muscles in the body.

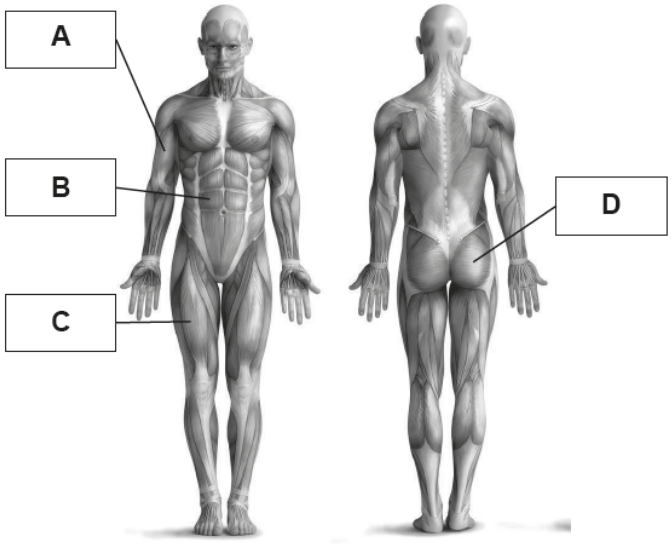

Fig. 12.1

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

A.....

B .....

C .....

D.....

[4]

Well answered by most, although there are still many candidates who are using muscle group names or abbreviations rather than the individual muscle name. For example, 'glutes' or 'gluteals' were often incorrectly given instead of the full name 'gluteus maximus'. Examiners for such questions are required to mark the first answer given, therefore a list of possible muscles is unlikely to attract any marks. Examiners did accept mis-spellings, as long as the word/phrase is recognisable, but centres are reminded to reinforce the need for good spelling, with perhaps candidates keeping an individual 'glossary' of terms / words that are common technical words in the specification.

Question 13(a)

13 (a) Describe **three** structural characteristics of slow oxidative muscle fibres.

1.....

.....

2.....

.....

3.....

.....

[3]

The question asks for structural characteristics, but many candidates gave functional and therefore scored few marks. If candidates stuck to structural characteristics they usually did well with this question. Centres and their candidates should be aware that although the colour of the fibres – in this case red – could be identified as structural, examiners expect for this level 3 qualification that this is unworthy of credit.

Question 13(b)

(b) Explain the effects of a cool down on the muscular system.

.....

.....

.....

.....

.....

.....

.....

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

Very few achieved the full 3 marks for this question. Most identified that a cool down helps to remove lactic acid, although some incorrectly stated that the cool down prevents the build-up of lactic acid. For 3 marks to be scored, 3 points need to be made.

Question 14

14 **Fig. 14.1** shows a table tennis player performing a shot with top spin.

Fig. 14.1

Explain how the muscles acting at the radio-ulnar joint work together to move the forearm into the position shown in the picture in order to produce top spin on the ball.

.....

.....

.....

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

This question often attracted 0 marks, with some candidates simply leaving out this question altogether. Others had a go and got the joint movement as pronation, but were unable to identify pronator teres and the supinator as well as linking to the agonist and antagonist to score well. A minority of candidates really nailed this question and gave succinct but accurate explanations with the correct terminology.

Question 15

15 Complete the table below to identify the structure of the heart which relates to each function.

Structure of heart	Function
.....	Allows blood to pass from the left atrium to the left ventricle but closes to prevent backflow of blood.
.....	Receives de-oxygenated blood from the vena cava
.....	Carries oxygenated blood from the lungs to the heart
.....	Contracts to pump de-oxygenated blood to the lungs

[4]

Most got the first 3 structures correct which shows good preparation for this part of the specification but some were unable to give the structure that contracts to pump de-oxygenated blood to the lungs. The clue is in the first bit 'contracts to pump' which indicates the ventricle rather than a blood vessel such as the pulmonary artery often incorrectly given as an answer.

Question 16

16 Define the terms 'stroke volume' and 'cardiac output'. State typical resting values for each for an untrained individual.

Stroke volume .....

.....

Typical untrained resting value .....

Cardiac output.....

.....

Typical untrained resting value .....

[4]

Definitions are recall type questions that must be thoroughly and accurately learnt by candidates. Many candidates gave accurate definitions, but many omitted the word 'heart' or ventricle in their answers. Others were also unable to score marks for the values because they were either inaccurate values or there were no associated units. Any value or calculation must have a relevant unit to score a mark.

Question 17

17 The following paragraph describes arterioles. Complete the paragraph by selecting words from the box below.

capillaries	contracts	lumen	venules	large
media	small	relaxes	smooth	

Arterioles are blood vessels with thick walls and a …… diameter.

The tunica …… consists of some elastic fibres and relatively large amounts of …… muscle.

This muscle …… to reduce the size of the ……, causing vasoconstriction, and then …… to increase its width, causing vasodilation.

Arterioles subdivide into ……, which are the smallest blood vessels in the body.

[7]

This was very well done by most candidates, showing a good level of preparation for this part of the specification. A high number of candidates put that arterioles had a small diameter, rather than a large diameter. A small number of candidates left out some words altogether.

Question 18(a)

18 (a) Describe the roles of the following respiratory structures.

Nasal cavity .....

.....

Epiglottis .....

.....

Alveoli .....

.....

[3]

This was mostly answered well with at least 2 marks being scored by many with some excellent answers describing the less well-known epiglottis.

Question 18(b)

(b) Explain the role of the external intercostal muscles during the mechanics of breathing.

.....

.....

.....

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

The mechanics of breathing has traditionally been the 'Achilles heel' for candidates who have often tied themselves up into knots trying to explain this topic area. Answers this examination series brought a breath of fresh air – with many scoring the full 4 marks. There are still too many candidates mixing up the mechanics for inspiration with expiration and vice versa. Some gave answers which made it unclear whether the mechanics belonged to inspiration or expiration. It is important that candidates identify for the examiner which explanation refers to inspiration and which for expiration.

Question 19(a)

19 (a) State how minute ventilation changes once exercise starts and why this happens.

.....

.....

.....

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

This was answered well with lots of evidence of good teaching and learning for this part of the specification. Many scored the full 2 marks for this part.

Question 19(b)

(b) Explain why minute ventilation is higher during recovery than at rest.

.....

.....

.....

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

This part was a little less well done, with some candidates only making 1 clear point about why minute ventilation is higher during recovery – 2 clear points are needed for this 2 mark question. Note that CO^2 is produced all the time, so examiners are looking for 'more' CO^2 to be exhaled.

Question 20(a)

20 (a) Apply your knowledge of the ATP-PC system to complete the table below.

Type of reaction	.....
Chemical or food fuel	.....
Amount of ATP produced	.....
By-products of the reaction (if any)	.....

[4]

A mixed response to this question, with only a minority scoring the full 4 marks. Many did not identify the type of reaction is anaerobic.

Question 20(b)

(b) Describe the recovery process for the lactic acid system, including the timescale for a full recovery.

.....

.....

.....

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

A weaker area of candidates' knowledge generally. Centres are advised to re-visit the teaching of this area to ensure thorough understanding by candidates of the recovery process for the lactic acid system. Few candidates, for example, know an accurate timescale for a full recovery.

Section C

Question 21*

Fig. 21.1 shows different views of the vertebral column.

Fig. 21.1

21* Explain the structures and functions of the vertebral column. Your answer should include:

- The different sections of the vertebral column
- Types of joint
- Joint movements with practical examples
- Functions of the vertebral column

[10]

.....

.....

.....

.....

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

Only a very small minority of candidates were credited 0 marks for this question this series. The question was attempted by most candidates.

This extended question is also assessed on the quality of written communication and the better responses again showed a fluent and accurate approach, with few spelling errors and with good use of

clear sentences and paragraphs. Lower ability candidates again showed limited structure and accuracy in spelling.

The question guides the candidate so that they have some checkpoints i.e. sections, types, joint movements (with practical examples) and functions. The more able candidates followed this guidance and produced an often comprehensive and accurate response scoring well on the levels mark scheme. These more able candidates often ticked off the guidelines in the question just to check that they had included all the necessary material. The sections of the vertebral column were well-known by most candidates, as were the functions. Less well-known were the joint movements and types of joint. Candidates are reminded that they will often be asked for practical examples in these extended questions and to be prepared to answer using full explanations of each example used. It was noted that many candidates are using the correct technical vocabulary expected for this level 3 qualification, for example lateral flexion and hyperextension.

Candidates that scored less well for this question, were too brief, often simply writing notes rather than full sentences and therefore not explaining their points. Others did not cover all the criteria set out in the question or wandered off the point and wrote about muscle actions rather than sticking to points related to the vertebrae.

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