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Examiners' report

SPORT AND PHYSICAL ACTIVITY

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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.

Unit 1 series overview

Generally, most candidates performed well in this unit. Some centres' candidates showed gaps in their knowledge for specific syllabus areas, for example in the accurate identification of specific muscles in Question 12 and the function of various structures of the heart in Question 16. Although the vast majority of candidates showed that they were well prepared for this paper, a few candidates had been entered with little knowledge of this unit. Those that did well read each question carefully and answered succinctly and stuck to the requirements of each question. Some candidates misread questions and answered based on the incorrect body system, for example giving responses related to the heart instead of the respiratory system in Question 19.

Most candidates are now well prepared for the extended question – Question 21 – and showed a fluent and accurate response. Those that did particularly well on this extended question showed good quality of written communication and showed a plan before they started to write their answer.

Candidates who did well on this paper generally did the following:	***Candidates who did less well on this paper generally did the following:***
• read each question carefully and stuck to the requirements of the question • covered each of the variables in Question 21 and wrote with fluency and showed good planning • made careful note of the relevant body system before answering • were well prepared for answering questions covering the whole syllabus • obeyed the 'command' word in each question.	• misread the requirements of some questions and used irrelevant material • ignored some aspects of the question • did not note the relevance of the 'command' word in a question, for example described rather than explained • wrote about an irrelevant body system • did not plan effectively for responding to the extended Question 21.

Section A overview

Most candidates scored well for this section, including responses to the multi-choice type questions. Some candidates misread the questions that includes the statement 'which one of the following is **not**…', and so scored zero marks for this particular question. Candidates are reminded to take care to read each question carefully. It is good practice to re-visit Section A to check through their answers.

Question 1

1 Which one of the following components of blood fights bacteria and viruses?

(a) Plasma ☐

(b) Platelets ☐

(c) Red blood cells ☐

(d) White blood cells ☐

[1]

Most candidates recognised that (d) was the correct answer.

Question 2

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

(a) Deltoid ☐

(b) Latissimus dorsi ☐

(c) Pronator teres ☐

(d) Trapezius ☐

[1]

Many candidates did not recognise that (a) was the correct answer. Many incorrectly picked the latissimus dorsi as the muscle causing flexion at the shoulder.

Question 3

3 Which one of the following is **not** a fuel for the aerobic system?

(a) Carbohydrates ☐

(b) Glucose ☐

(c) Lipids ☐

(d) Phosphocreatine ☐

[1]

Most candidates recognised that (d) was the correct answer. Those that scored zero chose (a) incorrectly.

Question 4

4 Which one of the following is the correct order of air flow into the lungs?

(a) Bronchiole → alveoli → bronchus ☐

(b) Bronchiole → bronchus → alveoli ☐

(c) Bronchus → trachea → alveoli ☐

(d) Trachea → bronchus → bronchiole ☐

[1]

Most candidates recognised that (d) was the correct answer.

Question 5

5 Which one of the following correctly describes cardiac output?

(a) Number of contractions of the heart per minute ☐

(b) Volume of blood pumped out of the atria per minute ☐

(c) Volume of blood pumped out of the heart per minute ☐

(d) Volume of blood pumped out of the ventricles per beat ☐

[1]

Many scored a mark for this. Many of those candidates who scored zero incorrectly chose (c).

Question 6

6 Which one of the following is **not** a benefit of a cool down?

(a) Faster removal of lactic acid ☐

(b) Reduced blood pooling ☐

(c) Reduced flexibility ☐

(d) Reduced muscle soreness ☐

[1]

Most candidates recognised that (c) was the correct answer.

Question 7

7 Which one of the following describes the concentration of a gas within a mixture of gases?

(a) Diffusion gradient ☐

(b) Gaseous exchange ☐

(c) Internal respiration ☐

(d) Partial pressure ☐

[1]

Although many candidates recognised that (d) was the correct answer, a substantial minority were not aware of the correct description of the concentration of a gas within a mixture of gases.

Question 8

8 Which one of the following describes the recovery process for the ATP-PC/alactic system?

(a) Increases production of mitochondria ☐

(b) Involves removal of lactic acid ☐

(c) Involves restoration of glycogen ☐

(d) Takes two to three minutes ☐

[1]

Most candidates recognised that (d) was the correct answer.

Question 9

9 Identify the gas produced as a by-product of the aerobic energy system.

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

Many recognised carbon dioxide as the correct gas produced. Those that scored zero often wrote oxygen or lactic acid as incorrect responses. A few left this unanswered.

Question 10

10 State the formula for calculating cardiac output (Q).

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

The majority of candidates wrote the correct formula, although some wrote 'bpm' for heart rate which was deemed to be insufficient at this level.

Section B overview

These short answer type questions were answered well by the majority of candidates, although those that scored few marks showed significant gaps in their knowledge of certain areas of the syllabus.

Key point call out

Those that did well stuck to the requirements of the question and referred to the correct body system. Examiners mark the first response given by the candidate and therefore those that hedged their bets and wrote a number of answers often scored low marks.

Question 11 (a)

11 (a) **Fig. 11** shows a diagram of the bones of the arm and hand.

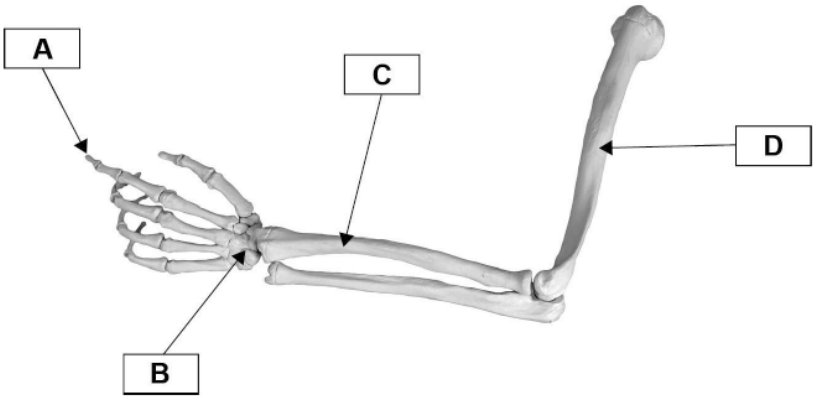

Fig. 11

Identify A, B, C and D on the diagram.

A .....

B .....

C .....

D .....

[4]

Many scored well on this question. Those that did not score full marks often incorrectly identified B and C on the diagram. Some candidates' spelling of the relevant bones was poor, although if phonetically correct, examiners gave the benefit of the doubt.

Key point call out

It is advised that candidates learn the correct spelling of anatomical structures named in the syllabus.

A tip to remember the position of the ulna is to learn that the ulna is under the elbow when the thumb is held upwards.

Question 11 (b)

(b) Complete the table to identify the joint movements in the practical examples.

Joint movement	Practical example
.....	Knee: Bending the knee in preparation to jump.
.....	Shoulder: Making circles with the arm to warm the shoulder muscles up.
.....	Ankle: Pointing the toes during a handstand.

[3]

Many correctly identified the relevant joint movements. Those that did not score full marks often incorrectly stated that pointing the toes is dorsi flexion instead of planta flexion. Many thought incorrectly that making circles with the arms was rotation at the shoulder instead of circumduction.

Question 12

12 **Fig. 12** shows the major skeletal muscles of the leg.

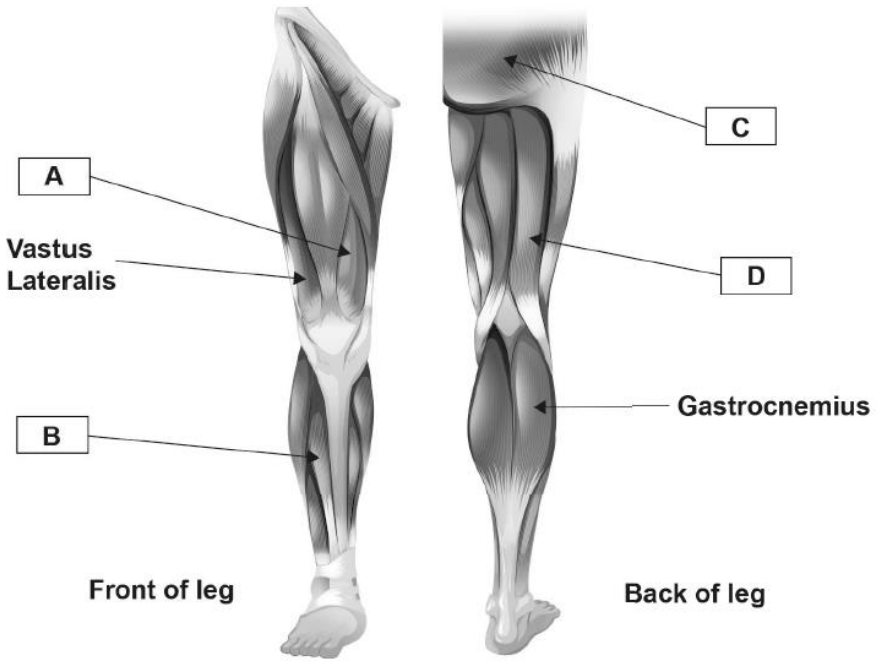

Fig. 12

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

A .....

B .....

C .....

D .....

[4]

This question proved difficult for many candidates who seemed unaware of the correct anatomical terms for each of the labelled muscles. The most common incorrect answers were for muscles A and B.

Question 13

13 **Fig. 13** shows the upward phase of a pull up.

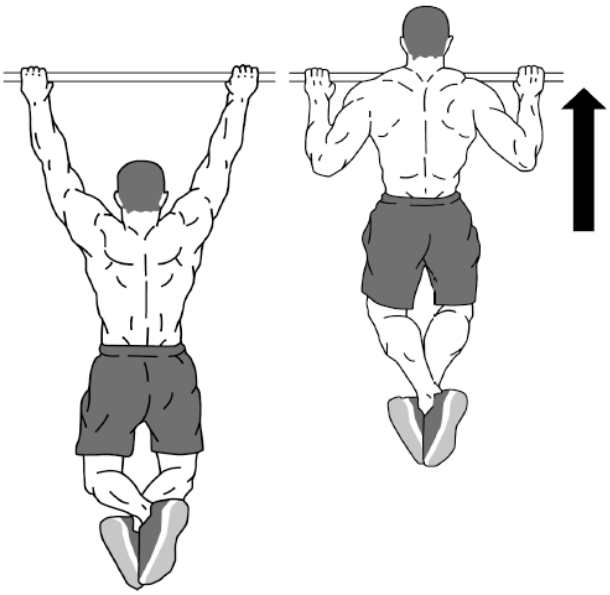

Fig. 13

Complete the table to analyse the movement at the elbow and wrist during the upward phase of the pull up.

Joint	Muscle function	Muscle acting	Type of muscle contraction
Elbow	Agonist	.....	.....
Wrist	Fixator	Pronator teres	.....

[3]

Most scored at least 2 marks for this question. The most common incorrect response was for type of muscle contraction at the wrist joint. Candidates are reminded that 'isotonic' refers to both concentric and eccentric muscle contractions.

Key point call out

Any movement analysis should show whether a muscle contraction is concentric, eccentric or isometric.

Question 14

14 State which muscle fibre type would be mainly used in the following activities:

400 m race in athletics .....

10 km walking race .....

Tennis smash.....

50 m swimming race .....

[4]

Many candidates scored at least 1 mark for this demanding question. Many that scored 3 marks from a possible 4 incorrectly identified the muscle fibre type for the 50m swimming race. The syllabus lists slow oxidative, fast oxidative and fast glycolytic muscle fibres.

Key point call out

Centres are strongly encouraged to teach these terms and candidates are expected to understand and apply them to sporting situations.

Some candidates used the terms 'type I, type IIa, type IIb and/or type IIx'. These are recognised as equivalent terms and were credited if correctly matched to the sporting examples.

Question 15

15 Describe **four** short-term effects of exercise on the muscular system.

1.....

.....

2.....

.....

3.....

.....

4.....

.....

[4]

Most candidates scored at least 2 marks from a possible 4 marks for this question. Many candidates incorrectly referred to body systems other than the required muscular system, for example the short-term effects of exercise on the heart.

Key point call out

Candidates are reminded to read each question carefully and to take particular note of the relevant body system – in this case the muscular system.

Question 16

16 Complete the table to identify and describe the function of various structures of the heart.

Structure	Function
Bicuspid valve	1..... ....
2.....	This chamber receives blood from the pulmonary vein.
3.....	The walls of this chamber contract to pump deoxygenated blood to the lungs.
Vena cava	4..... ....
5.....	This valve closes to prevent blood flowing back into the left ventricle.

[5]

This was incorrectly or very well answered, depending on whether the candidate was familiar with the functions of heart structures. A common incorrect response was identifying the aortic valve as a tricuspid valve. Many candidates, however, responded to each structure well and scored high marks.

Question 17 (a)

17 (a) Outline **three** differences between arteries and veins.

1.....

.....

2.....

.....

3.....

.....

[3]

The question requires candidates to state the differences. Those candidates who scored few or zero marks did not write a comparison, for example merely stating that arteries have 'thick walls', which does not show a difference. If a candidate wrote 'thicker' walls – this showed a comparison. Those that scored well stated the characteristic of an artery and then directly contrasted this with a characteristic of a vein – for example 'veins have valves, whereas arteries do not'. Candidates are reminded that not all arteries carry oxygenated blood, and not all veins carry deoxygenated blood, so this difference was not credited.

Question 17 (b)

(b) As blood leaves the heart it passes through a series of blood vessels.

Other than arteries and veins, identify **three** different types of blood vessel in the body.

1.....

2.....

3.....

[3]

This was answered well by most candidates who showed good knowledge of different types of blood vessel.

Question 18 (a)

18 (a) The sentences below describe the mechanics of breathing during inspiration.

Complete the sentences by filling in the missing words.

The ……..…….....……..…..... and ……..…….....……..…..... muscles contract.

The ……..…….....……..…..... move(s) upwards and outwards.

The volume of the ……..…….....……..…..... increases.

This causes pressure in the lungs to ……..…….....……..…..... .

Air is drawn into the lungs.

[5]

The mechanics of breathing is often a topic that candidates find difficult to understand and to describe. For this series, however, it was pleasing to note that many candidates have a good understanding of this topic. Those that scored less well were not accurate enough in their description, for example merely stating intercostal as a contracting muscle rather than the external intercostal.

Question 18 (b)

(b) **Fig. 18** shows a graph of minute ventilation before, during and after sub-maximal exercise.

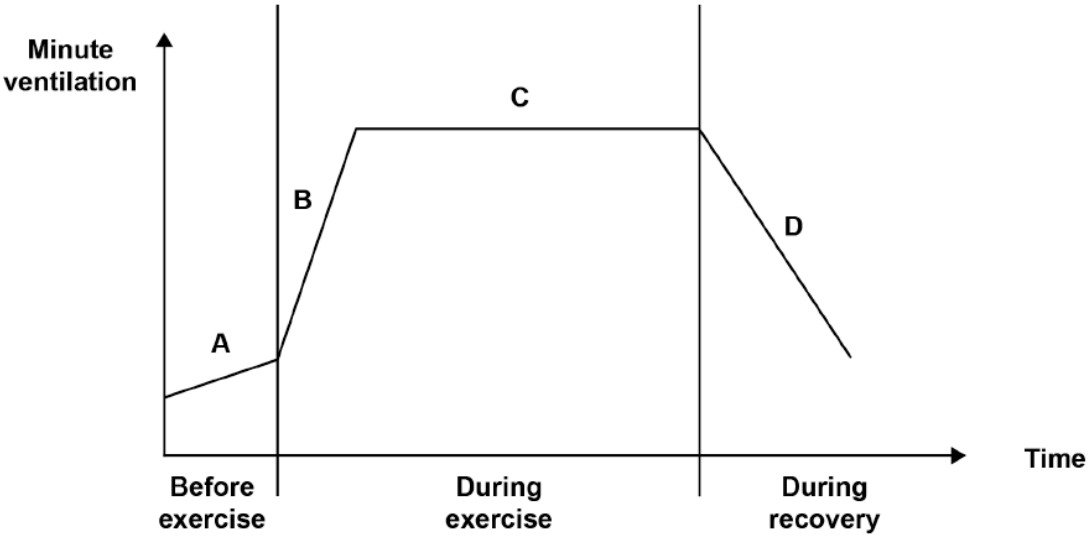

Fig. 18

Explain the changes in minute ventilation before exercise, during exercise and during recovery.

A - Before exercise

.....

.....

.....

B - Initial increase during exercise

.....

.....

.....

C - Steady-state plateau during exercise

.....

.....

.....

D - During recovery

.....

.....

.....

[4]

This question requires an explanation, rather than a description. Many candidates wrote a description of the graph and not an explanation and therefore scored few marks.

Question 19

19 Describe **three** long-term effects of regular exercise on the respiratory system.

1.....

.....

2.....

.....

3.....

.....

[3]

This question relates to the respiratory system. Those that scored few marks often confused this system with other body systems. Candidates who scored well described three different long-term effects and were accurate in their responses.

Key point call out

Centres are encouraged to teach the long-term effects of exercise on the respiratory system in more detail. For example, studies show that there is very little change in resting tidal volume, but large differences in tidal volume during exercise between trained and untrained individuals. Similarly, maximal and resting values should be taught for breathing frequency and minute ventilation.

Question 20 (a)

20 (a) **Fig. 20** shows an example of an energy continuum.

Fig. 20

Show your knowledge of energy systems by placing the letters A, B and C to show where each of the following sporting activities would be on the energy continuum:

A Gymnastics floor routine

B Discus throw

C 10 km swim.

[3]

Many candidates showed a good knowledge of energy systems and correctly placed the activities on the energy continuum. Those that scored less well, often incorrectly placed the gymnastics floor routine towards the aerobic end of the continuum.

Question 20 (b)

(b) Justify your placement of B and C on the energy continuum.

.....

.....

.....

.....

.....

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

This part of the question was also answered well, with clearly written justifications for the placements of B and C on the energy continuum.

Section C overview

This extended question is marked using a 'levels' marking scheme. Those candidates who wrote fluently showed good written communication skills and thorough planning.

Question 21

21* The skeleton is made up of several types of bone. Short bones are one example.

Explain the functions of the skeleton and how they link to different types of bone.

Your answer should include:

- an explanation of the functions of the skeleton
- a description of the different types of bone (e.g. short bones)
- the functions of each type of bone, using examples of named bones.

[10]

.....

.....

.....

.....

.....

.....

The question asks for an explanation of the function of the skeleton and how they link to different types of bone. Those that scored well obeyed the requirement to make the links between functions of the skeleton and different types of bone. Others who scored less well listed the functions and the types of bone but rarely linked the two. The question also includes the requirement to include functions, descriptions and named bones. Those that covered all of these question variables scored well and often showed evidence of planning before they wrote their full response.

Once again, this series, candidates who have good written communication skills were able to access higher marks because their response showed a high level of explanation rather than mere description.

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