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OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Tuesday 12 January 2021 – Morning

Level 3 Cambridge Technical in Sport and Physical Activity

05826/05827/05828/05829/05872

Unit 1: Body systems and the effects of physical activity

Time allowed: 1 hour 30 minutes plus your additional time allowance

You can use:
a calculator

Please write clearly in black ink.

Centre number								
Candidate number								
First name(s)								
Last name								
Date of birth	D	D	M	M	Y	Y	Y	Y

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS

Use black ink. You can use an HB pencil, but only for graphs and diagrams.

Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.

Answer ALL the questions.

Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.

INFORMATION

The total mark for this paper is 70.

The marks for each question are shown in brackets [ ].

Quality of written communication will be assessed in questions marked with an asterisk (*).

ADVICE

Read each question carefully before you start your answer.

SECTION A

Answer ALL the questions. Put a tick (✓) in the box next to the ONE correct answer for each question.

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

(a) Latissimus dorsi ☐

(b) Deltoid ☐

(c) Pronator teres ☐

(d) Trapezius ☐

2 Which one of the following is NOT an expected value for cardiac output during exercise? [1]

(a) 5 litres/minute ☐

(b) 10 litres/minute ☐

(c) 15 litres/minute ☐

(d) 20 litres/minute ☐

3 Which one of the following statements about gaseous exchange at the alveoli is correct? [1]

(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 ☐

4 Which one of the following is NOT a short-term effect of exercise on the muscular system? [1]

(a) Increase in glycogen stores ☐

(b) Increase in lactic acid ☐

(c) Increase in blood flow ☐

(d) Decrease in phosphocreatine ☐

5 What type of bone is the patella? [1]

(a) Flat ☐

(b) Short ☐

(c) Sesamoid ☐

(d) Irregular ☐

6 Which one of the following blood vessels carries blood at the lowest pressure? [1]

(a) Arteries ☐

(b) Arterioles ☐

(c) Venules ☐

(d) Veins ☐

7 Which one of the following is NOT a fixator muscle during a biceps curl? [1]

(a) Deltoid ☐

(b) Triceps brachii ☐

(c) Trapezius ☐

(d) Teres major ☐

8 Which one of the following bones is part of the appendicular skeleton? [1]

(a) Sternum ☐

(b) Scapula ☐

(c) Cranium ☐

(d) Coccyx ☐

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

_____ **[1]**

10 Identify ONE of the three stages of the aerobic system.

_____ **[1]**

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SECTION B

Answer ALL the questions.

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]

(b) Describe TWO functions of the vertebral column.

1_____

_____

2_____

_____

[2]

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

Fig. 12.1

Synovial Joint

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

Synovial fluid _____

_____

Joint capsule _____

_____

[2]

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(b) Fig. 12.2 shows images of synovial joints at the shoulder and hip.

Fig. 12.2

SHOULDER

HIP

Compare the synovial joints at the shoulder and the hip.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____ **[3]**

13 Complete the table opposite to identify the joint movements described. [5]

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]

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.

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

(a) Label the muscle fibre types A and B in the boxes on the diagram. [2]

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

_____

_____

_____

_____

_____

_____ **[3]**

Fig. 15

16 Fig. 16 shows a diagram of the heart.

Fig. 16

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

A _____

B _____

C _____

[3]

(b) Explain the functions of B and C.

B _____

_____

C _____

_____

[2]

17 (a) Complete the table below describing the structures of the lungs and their roles. [3]

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	

(b) Complete the paragraph below which describes the mechanics of breathing during expiration. [5]

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.

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

Breathing frequency _____

_____

Average resting value _____

Tidal volume_____

_____

Average resting value _____

[4]

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

Complete the flow chart opposite by filling in the missing words. [3]

Fig. 19

20 Fig. 20 opposite 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.

(a) Identify a games activity of your choice opposite, and indicate on the bar chart the energy system usage of a player in that game. [1]

Game _____

(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]

Fig. 20

Energy system usage during activity
Key:
Aerobic system
Lactic acid system
ATP-PC system
Marathon runner
Games player

SECTION C

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]

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional answer space is required, you should use the following lined pages. The question numbers must be clearly shown in the margins.

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