OCR
Oxford Cambridge and RSA

Monday 13 May 2024 – Afternoon

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
C400/2406

C400/2406

You can use:
- a calculator

0 5 8 2 6 – 0 1

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number | | | | | | Candidate number | | | | |

First name(s) _____

Last name _____

Date of birth | D | D | M | M | Y | Y | Y | Y |

INSTRUCTIONS
- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Answer **all** the questions.
- 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.
- 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 (*).
- This document has **20** pages.

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 helps blood to clot?

(a) Plasma ☐

(b) Platelets ☐

(c) Red blood cells ☐

(d) White blood cells ☐

[1]

2 Which one of the following is a typical resting value for tidal volume for a trained individual?

(a) 0.1 litres ☐

(b) 0.5 litres ☐

(c) 1.0 litres ☐

(d) 1.5 litres ☐

[1]

3 Which one of the following athletic events would **not** benefit from a high percentage of fast glycolytic muscle fibres?

(a) Marathon ☐

(b) Pole vault ☐

(c) Shot put ☐

(d) Triple jump ☐

[1]

4 Consider the following statements:

A – Improved posture is a long-term effect of exercise on the skeletal system.
B – Increased bone density is a long-term effect of exercise on the skeletal system.
C – Increased risk of osteoporosis is a long-term effect of exercise on the skeletal system.

Which of the above statements are correct?

(a) A and B ☐

(b) A and C ☐

(c) A, B and C ☐

(d) B and C ☐

[1]

5 Which one of the following is the equation for calculating minute ventilation?

(a) Stroke volume x breathing frequency ☐

(b) Stroke volume x tidal volume ☐

(c) Tidal volume x breathing frequency ☐

(d) Tidal volume x heart rate ☐

[1]

6 Which one of the following pairs of joint movements only occur at the ankle?

(a) Dorsiflexion and plantar flexion ☐

(b) Flexion and extension ☐

(c) Pronation and supination ☐

(d) Rotation and circumduction ☐

[1]

7 Which one of the following is **not** an effect of a cool down on the muscular system?

(a) Increases supply of oxygen ☐

(b) Maintains blood flow to muscles ☐

(c) Prevents blood pooling ☐

(d) Reduces the risk of arthritis ☐

[1]

8 What type of synovial joint is found at the shoulder?

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

9 What term is used for the volume of blood ejected by the heart per minute?

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

10 State **one** process that takes place during recovery for the ATP-PC / alactic energy system.

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

Section B

Answer **all** the questions.

11 One section of the vertebral column consists of the lumbar vertebrae.

Name **four** other groups of vertebrae found in the vertebral column.

1 .....

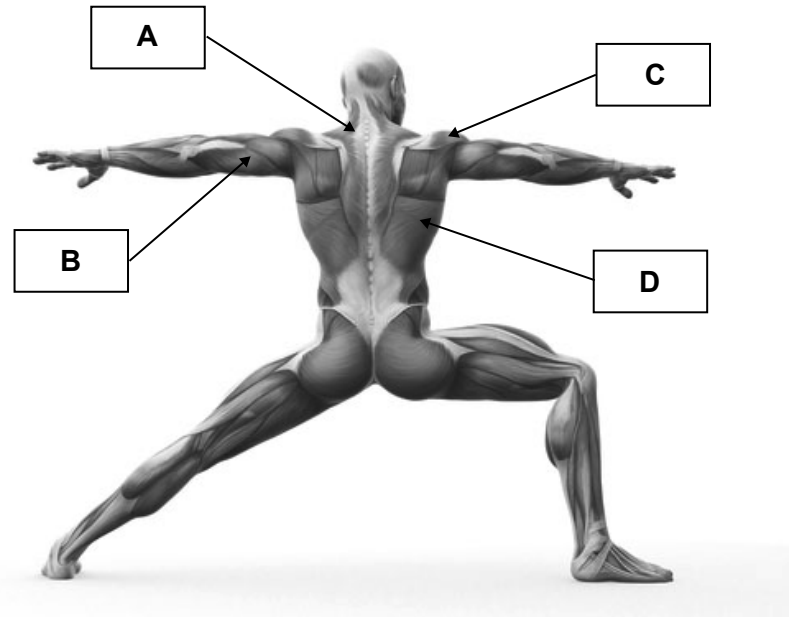
2 .....

3 .....

4 .....

[4]

12 The image below shows some of the major muscles of the human body.



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

A .....

B .....

C .....

D .....

[4]

13 The image below shows a volleyball player straightening their arms as they prepare to receive the ball.

(a) Explain how the muscles acting at the elbow work together to cause the elbow to extend to receive the ball.

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

(b) Describe the following types of muscle contraction:

Isometric contraction

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Concentric contraction

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.....

[2]

14 Outline **four** long-term effects of exercise on the muscular system.

1 .....

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2 .....

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3 .....

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4 .....

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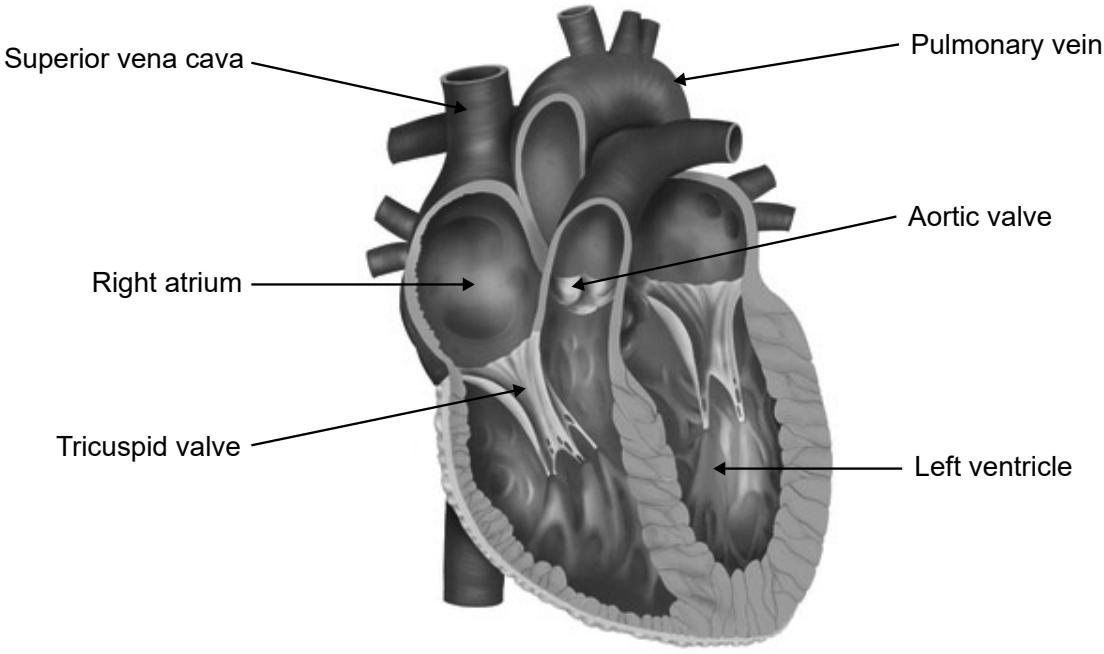
[4]

15 The image below shows the structures of the heart. **Two** structures are labelled incorrectly.



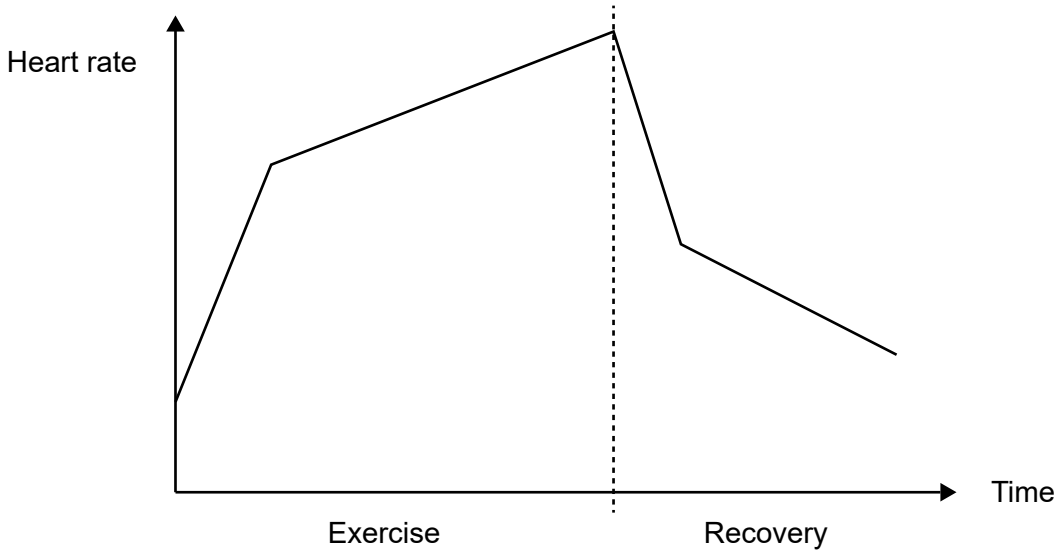
(a) Identify which **two** structures are labelled incorrectly and state the correct name for these structures.

Incorrect label …… Correct name ……

Incorrect label …… Correct name ……

[4]

(b) The graph below shows changes in heart rate during maximal exercise and during recovery.



(i) Explain why heart rate increases rapidly at first and continues to rise during maximal exercise.

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

(ii) Suggest **one** reason why the heart rate does not return immediately to resting heart rate during the recovery stage.

.....

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

16

(a) Blood travels through different blood vessels as it flows around the body.

Fill in the missing words to show the correct order of blood vessels after blood leaves the heart.

Arteries → ..... → Capillaries → ..... → Veins

[2]

(b) One effect of a warm up is to increase blood flow to the working muscles.

Describe **three** other effects of a warm up on the cardiovascular system.

1 .....

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2 .....

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3 .....

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[3]

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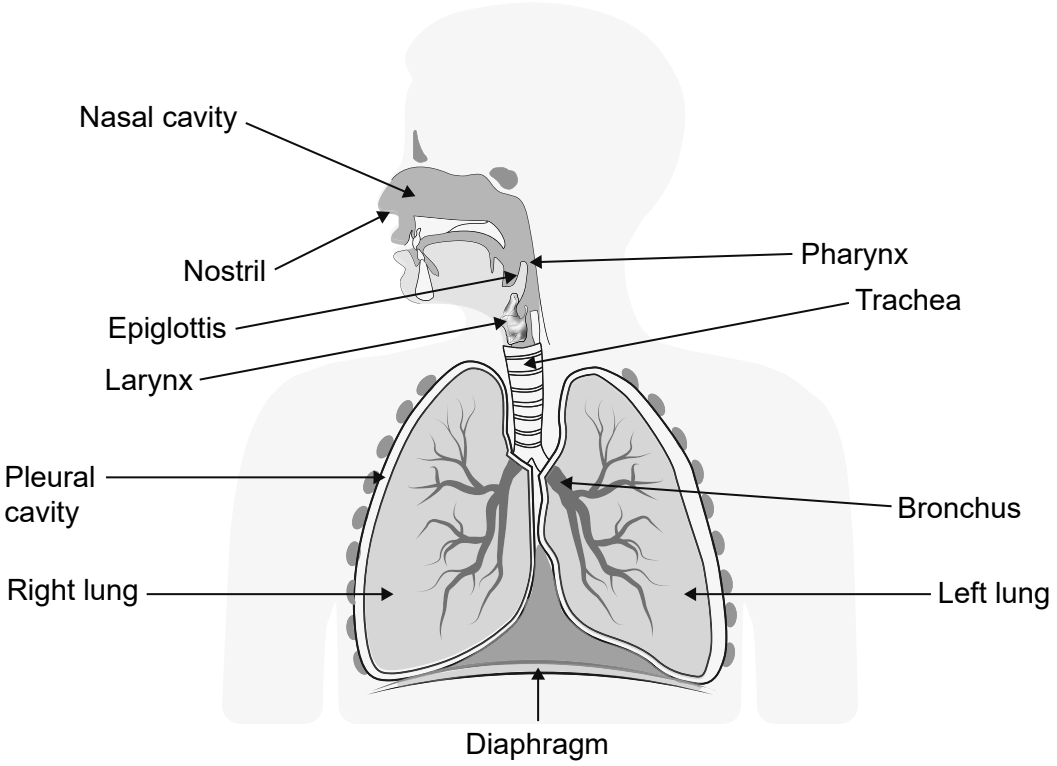
Turn over for the next question

17 The image below shows some of the structures of the respiratory system.



(a) Describe a different role each of the following structures plays in the respiratory system:

Nasal cavity .....

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Epiglottis .....

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Larynx .....

.....

[3]

(b) Describe how the structure of the alveoli allows gaseous exchange to take place efficiently.

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

Turn over for the next question

18 Respiratory muscles work together during ventilation. Some contract to cause inspiration, others contract to cause expiration.

Complete the table to describe the role of the respiratory muscles. The role of the diaphragm has been done for you.

Respiratory muscle	**Does the contraction cause inspiration or expiration?**
Diaphragm	Inspiration
Internal intercostals	.....
Pectoralis minor	.....
Rectus abdominis	.....
Sternocleidomastoid	.....

[4]

19 Consider the definitions of various lung volumes given below.

A – The number of breaths taken in one minute.
B – The total volume of the lungs after maximal inspiration.
C – The volume of air inspired or expired per breath.
D – The volume of air left in the lungs after maximal expiration.
E – The volume of air inspired or expired per minute.

Match the correct definition to each of the following lung volumes:

Breathing frequency = ...

Minute ventilation = ...

Tidal volume = ...

[3]

20

(a) Complete the paragraph using words from the word box to explain the lactic acid system.

aerobic	anaerobic	enzyme	glycogen	lipids
one	protein	pyruvic acid	thirty-eight	two

The type of reaction in the lactic acid system is ……..…….....……..…..... .

The fuel used for this system is ……..…….....……..…..... .

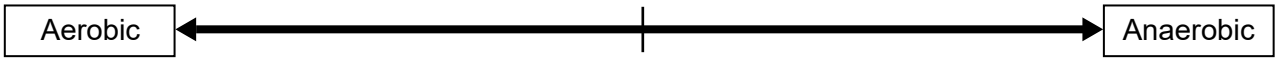
One molecule of this fuel produces ……..…….....……..…..... ATP in this system.

The by-product of the reaction is lactic acid, which inhibits ……..…….....……..……

activity.

[4]

(b) The image below shows an example of an energy continuum.



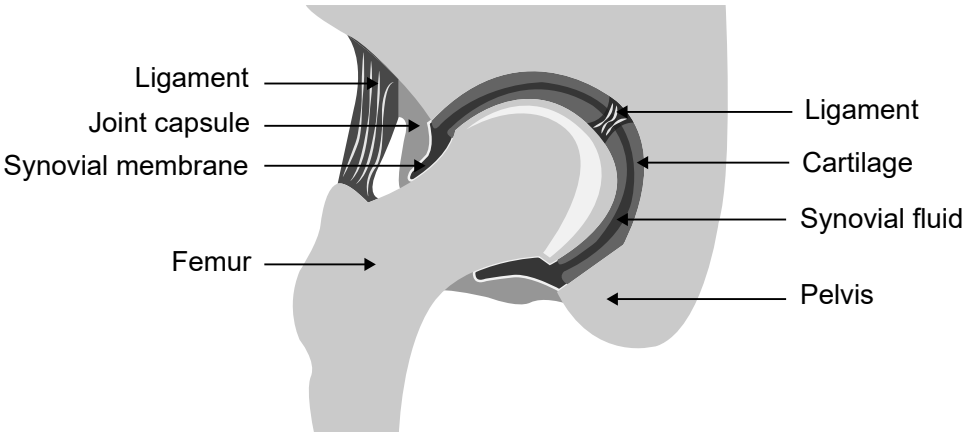
Show your knowledge of energy systems by placing the following sporting activities on the energy continuum.

A – A triathlon
B – A badminton smash
C – A basketball match.

[3]

Section C

21* The image below shows a diagram of the synovial joint at the hip with some structures labelled.



Describe the structures of synovial joints, including other structures that have not been identified in the image.

Explain how these structures allow synovial joints to function.

[10]

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END OF QUESTION PAPER

EXTRA ANSWER SPACE

If you need extra space use these lined pages. You must write the question numbers clearly in the margin.