

Thursday 18 May 2023 – 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
C400/2306



You can use:

- a calculator



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

Centre number

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Candidate number

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First name(s)

Last name

Date of birth

D	D	M	M	Y	Y	Y	Y
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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 (*).
- This document has **16** pages.

ADVICE

- Read each question carefully before you start your answer.

Section A

Put a tick (✓) in the box next to the **one** correct answer for each question.

1 Which one of the following is a typical resting value for minute ventilation?

(a) 0.1 litres per minute

(b) 0.6 litres per minute

(c) 1 litre per minute

(d) 6 litres per minute

[1]

2 Which one of the following components of blood contains haemoglobin?

(a) Plasma

(b) Platelets

(c) Red blood cells

(d) White blood cells

[1]

3 Which one of the following is **not** a long-term effect of exercise on the muscular system?

(a) Hypertrophy of muscles

(b) Increased muscular endurance

(c) Increased tolerance to lactic acid

(d) Reduced capillarisation

[1]

4 Consider the following lung volumes:

A – Breathing frequency

B – Minute ventilation

C – Tidal volume

Which of these lung volumes increase during exercise?

(a) **A** and **B** only

(b) **A** and **C** only

(c) **B** and **C** only

(d) **A, B** and **C**

[1]

5 Which one of the following pairs of muscles **both** cause movement at the shoulder?

(a) Deltoid and iliopsoas

(b) Deltoid and pectoralis major

(c) External oblique and pectoralis major

(d) External oblique and iliopsoas

[1]

6 Which one of the following valves is found between the right atrium and right ventricle?

(a) Aortic valve

(b) Bicuspid valve

(c) Pulmonary valve

(d) Tricuspid valve

[1]

7 Which one of the following describes the function of the epiglottis?

(a) Prevents food entering the lungs

(b) Removes carbon dioxide

(c) Site for gaseous exchange

(d) Warms and moistens air

[1]

8 State the technical name for the bones of the spine.

..... [1]

9 Which energy system uses phosphocreatine as a fuel?

..... [1]

10 Calculate the heart rate of an individual with a stroke volume of 70 millilitres per beat and a cardiac output of 4900 millilitres per minute.

..... (beats per minute) [1]

Section B

- 11 (a) Complete the following sentences, using words from the box below.

cartilage	levers	ligaments
organs	strength	tendons

Short bones are compact and are designed for weight-bearing and

.....

Long bones act as and are vital for movement.

Flat bones provide an attachment for muscles and often protect vital

.....

Sesamoid bones are found in and facilitate movement at a joint.

[4]

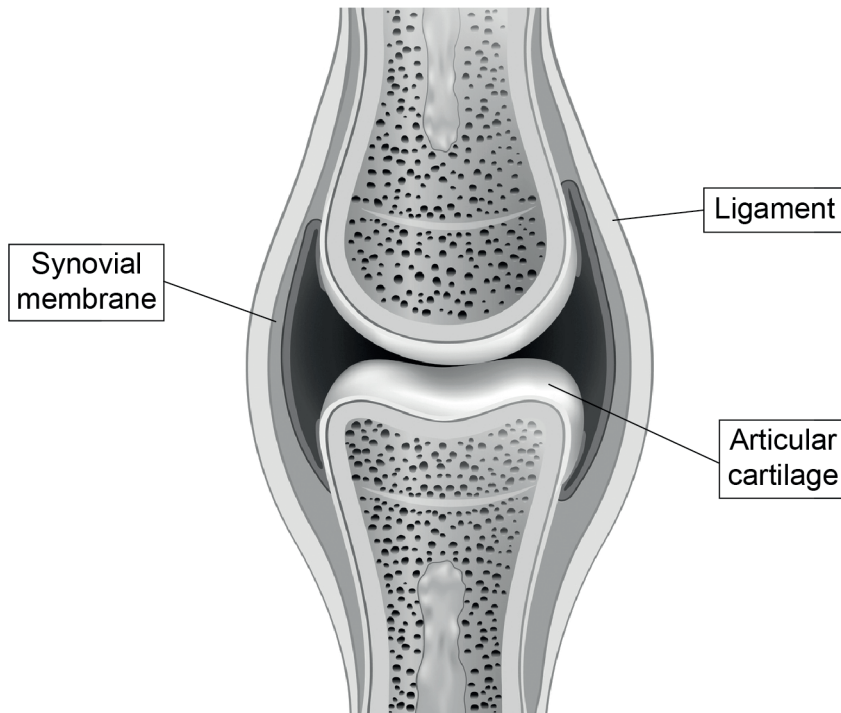
- (b) Name **two** bones of the axial skeleton, other than the bones of the spine.

1.....

2.....

[2]

12 The diagram shows a synovial joint with some structures labelled.



(a) Describe the function of each structure:

Articular cartilage

.....

Ligaments

.....

Synovial membrane

.....

[3]

(b) State **three** other structures that are found at a synovial joint.

1

2

3

[3]

13 (a) Identify **one** structural characteristic and **one** function of fast glycolytic muscle fibres.

Structure

Function

[2]

(b) Name an athletics event that relies mainly on fast glycolytic muscle fibres for success.

..... [1]

14 One effect of a cool-down on the muscular system is to increase the elasticity of muscle fibres.

Describe **three** other effects of a cool-down on the muscular system.

1.....

.....

2.....

.....

3.....

.....

[3]

15 Fig. 15 shows a diagram of the heart and the directional flow of blood through the heart.

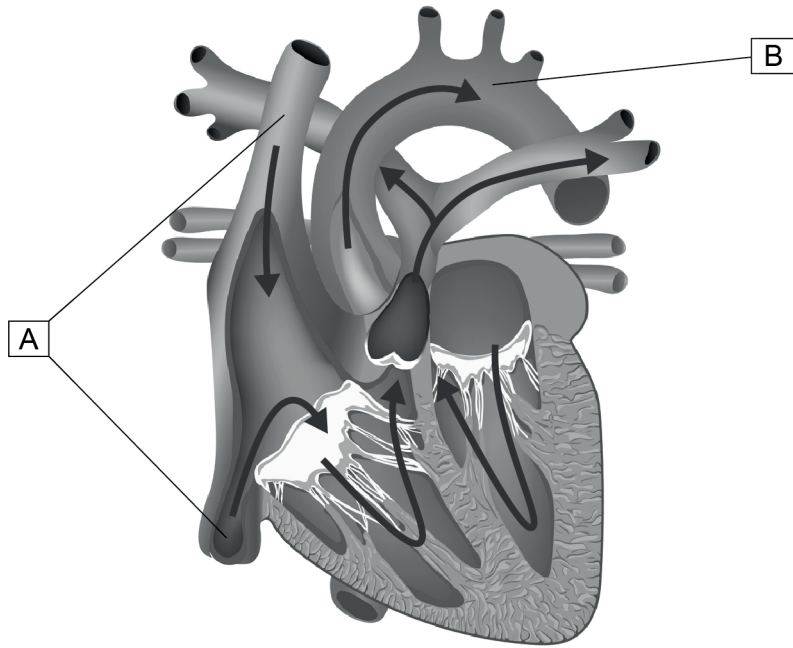


Fig. 15

(a) Identify structures **A** and **B** and describe the function of each.

A.....

Function of A.....

.....

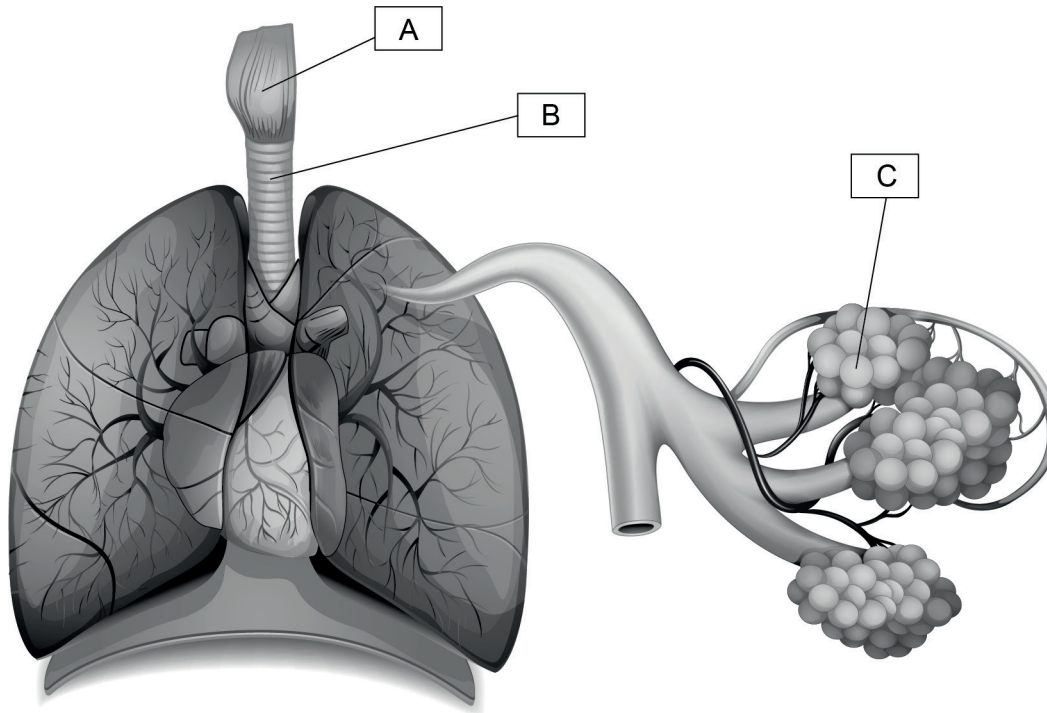
B.....

Function of B.....

.....

[4]

17 The diagram shows the structures of the lungs.



Identify the structures labelled **A**, **B** and **C**.

A.....

B.....

C.....

[3]

18 (a) Name **two** respiratory muscles that contract during inspiration.

1.....

2.....

[2]

(b) Describe what happens to the following during inspiration:

Movement of the ribs

.....

Volume of the thoracic cavity

.....

Pressure in the lungs

.....

[3]

(c) Explain how differences in partial pressures of gases enable gaseous exchange to occur in the lungs.

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..... [3]

19 Complete the table, using some of the words and numbers in the box below, to describe the main energy system used during a marathon.

aerobic	anaerobic	carbon dioxide	fats	minerals	
oxygen	proteins	water	1	2	36+

Type of reaction
Food fuels	carbohydrates and
Amount of ATP produced
By-products and H ₂ O

[4]

20 Complete the sentences to explain the recovery processes for the lactic acid system.

During recovery lactic acid is converted back to acid.

This is then oxidised or converted into

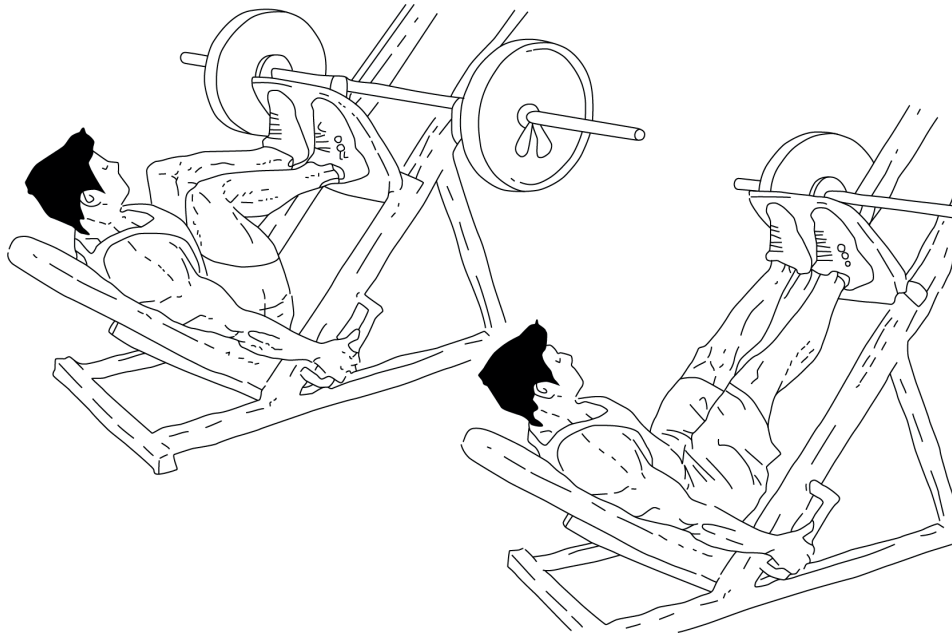
Lactic acid removal generally takes about, although it can take as much as 24 hours depending on intensity of work, fitness level and the recovery methods used.

One way to speed up the recovery process is to perform a

[4]

Section C

21* The diagram shows the performance of a leg press exercise.



Analyse the movements of the knee joint during both phases of the leg press.

Your answer should include:

- type of joint
- articulating bones
- joint movements
- main muscles acting
- the functions of the muscles involved
- types of muscle contraction.

[10]

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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 – for example, 15(b) or 21*.

A vertical line on the left side of the page is followed by 25 horizontal dotted lines, providing a ruled area for writing answers.



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