

Modified Enlarged 18 pt

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

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 plus your additional time allowance

**You can use:
a calculator**

Please write clearly in black ink.

**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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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

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? [1]

(a) 0.1 litres per minute

☐

(b) 0.6 litres per minute

☐

(c) 1 litre per minute

☐

(d) 6 litres per minute

☐

2 Which one of the following components of blood contains haemoglobin? [1]

(a) Plasma

☐

(b) Platelets

☐

(c) Red blood cells

☐

(d) White blood cells

☐

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

(a) Hypertrophy of muscles

☐

(b) Increased muscular endurance

☐

(c) Increased tolerance to lactic acid

☐

(d) Reduced capillarisation

☐

4 Consider the following lung volumes:

A – Breathing frequency

B – Minute ventilation

C – Tidal volume

Which of these lung volumes increase during exercise? [1]

(a) A and B only

☐

(b) A and C only

☐

(c) B and C only

☐

(d) A, B and C

☐

5 Which one of the following pairs of muscles BOTH cause movement at the shoulder? [1]

(a) Deltoid and iliopsoas

☐

(b) Deltoid and pectoralis major

☐

(c) External oblique and pectoralis major

☐

(d) External oblique and iliopsoas

☐

6 Which one of the following valves is found between the right atrium and right ventricle? [1]

(a) Aortic valve

☐

(b) Bicuspid valve

☐

(c) Pulmonary valve

☐

(d) Tricuspid valve

☐

7 Which one of the following describes the function of the epiglottis? [1]

(a) Prevents food entering the lungs

☐

(b) Removes carbon dioxide

☐

(c) Site for gaseous exchange

☐

(d) Warms and moistens air

☐

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 the words below. [4]

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.

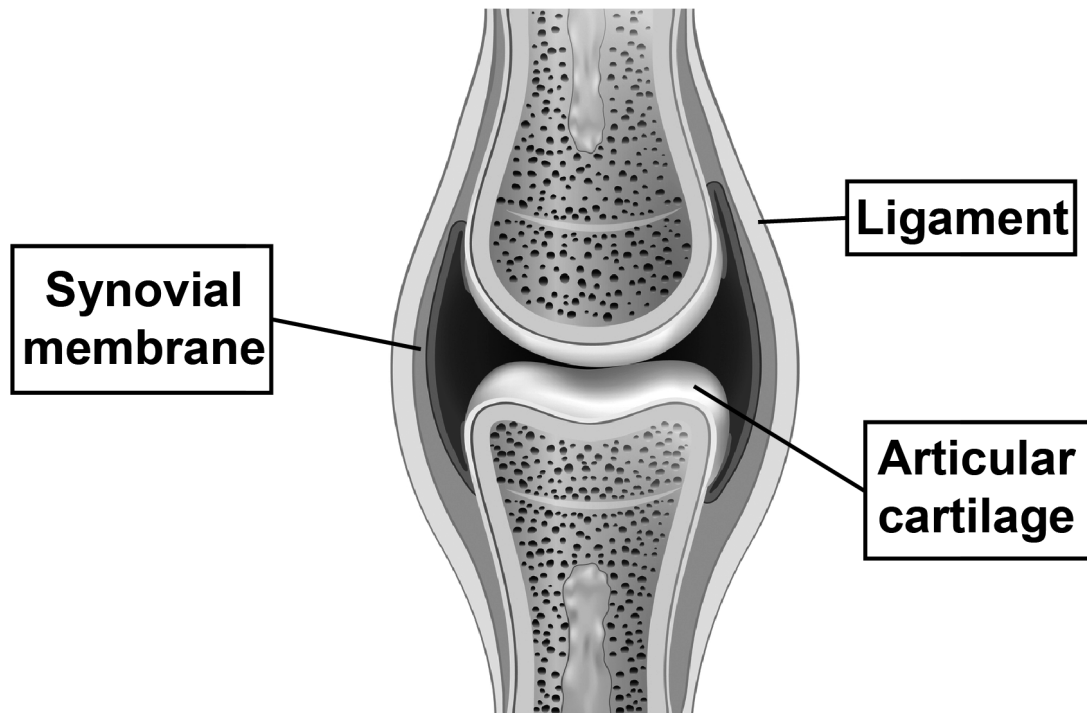
(b) Name TWO bones of the axial skeleton, other than the bones of the spine.

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 _____

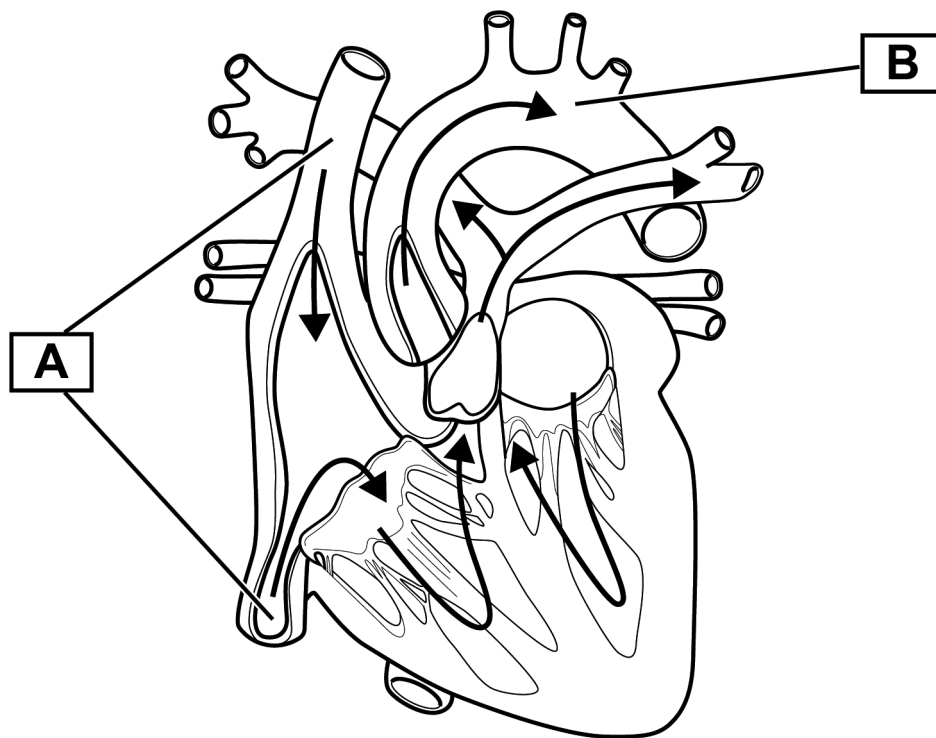
2 _____

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 _____

(b) Use FIG. 15 to explain how blood flows through the chambers and valves of the heart.

[4]

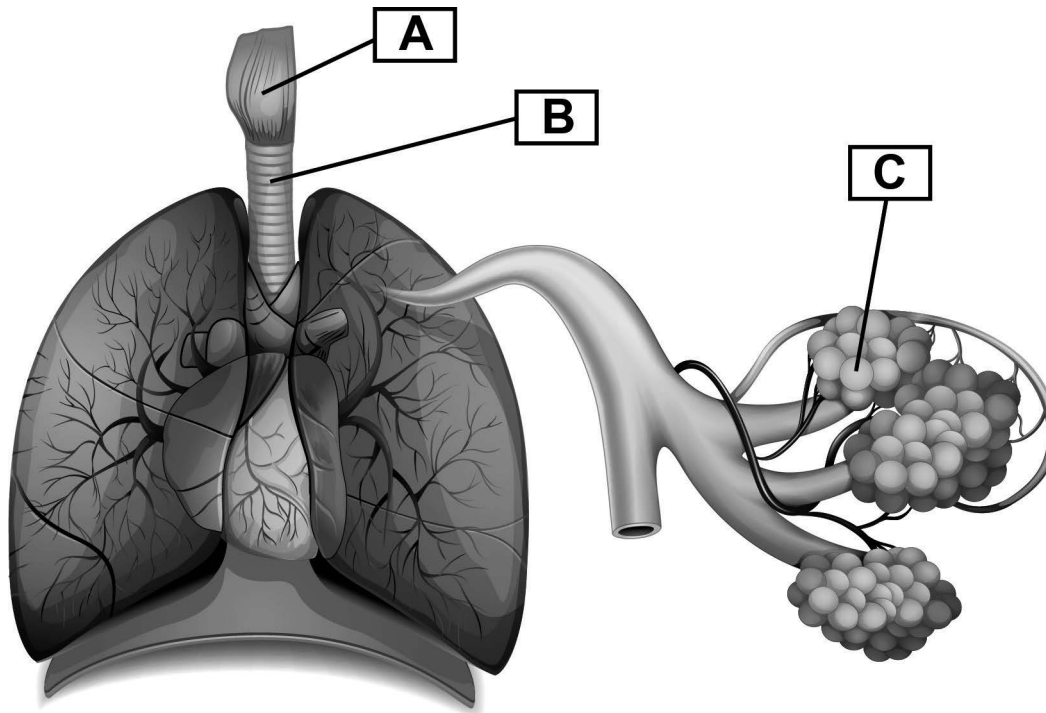
16 Complete the sentences to explain the effects of a warm-up on the cardiovascular system. [5]

A warm-up increases venous return which leads to an increase in _____ volume.

A warm-up initiates the _____ mechanism, which increases blood flow to the _____.

This is achieved by _____ and vasoconstriction of blood vessels and pre-capillary sphincters. A warm-up also increases temperature which _____ the viscosity of blood.

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.

[3]

19 Complete the table, using some of the words and numbers below, to describe the main energy system used during a marathon. [4]

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 H₂O

20 Complete the sentences to explain the recovery processes for the lactic acid system. [4]

During recovery lactic acid is converted back to

_____ acid.

This is then oxidised or converted into

_____ .

Lactic acid removal generally takes about

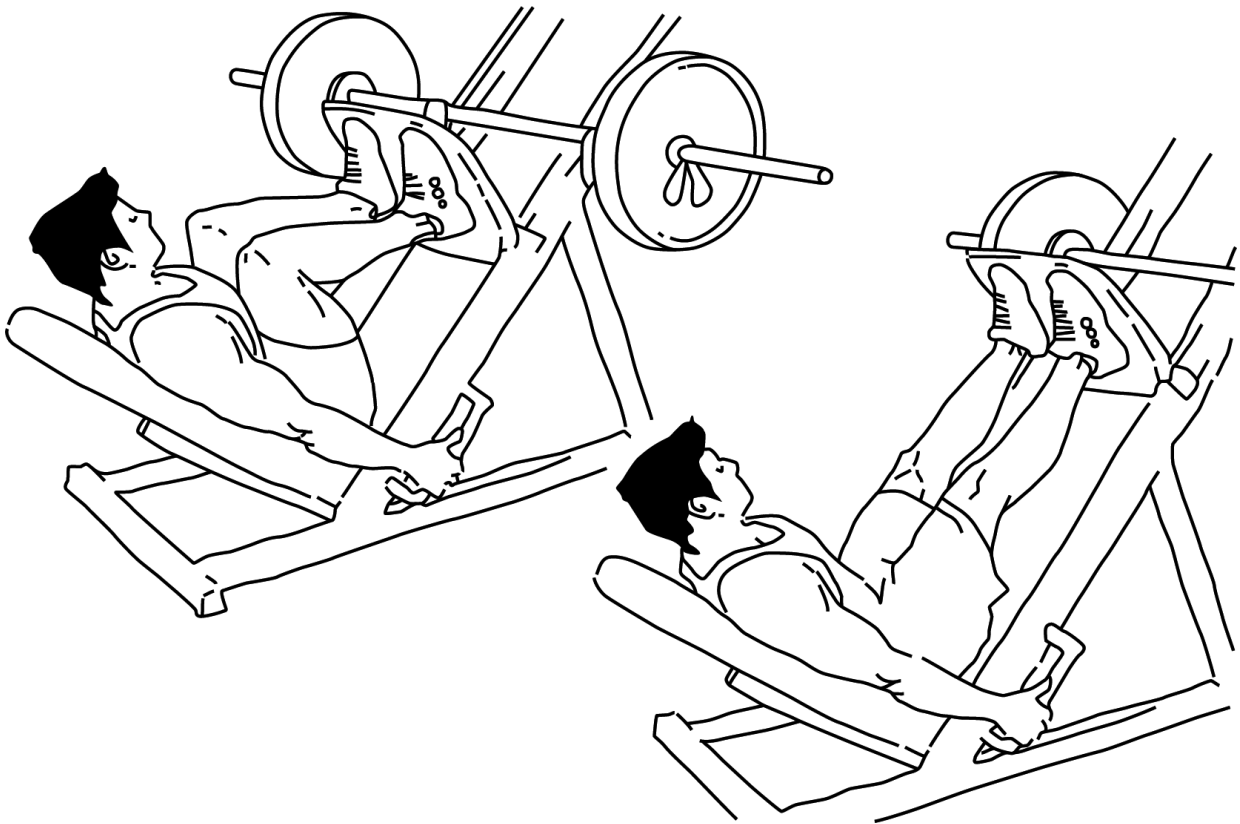
_____, although it can take as much as 24 hours depending on intensity of work, fitness level and the recovery methods used.

One way to speed up the recovery process is to perform

a _____ .

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. [10]

Your answer should include:

type of joint

articulating bones

joint movements

main muscles acting

the functions of the muscles involved

types of muscle contraction.

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 – for example, 15(b) or 21*.

[illegible]

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