

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

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INSTRUCTIONS

Use black ink.

Answer ALL the questions.

Write your answer to each question in the space provided.

If additional answer space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.

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 the question marked with an asterisk (*).

SECTION A

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

1 Which of the following athletic events relies predominantly on the lactic acid energy system? [1]

(a) 400 m hurdles

☐

(b) 1500 m

☐

(c) 100 m

☐

(d) Triple jump

☐

2 Which of the following are bones which form part of the appendicular skeleton? [1]

(a) Sternum and femur

☐

(b) Humerus and ribs

☐

(c) Scapula and clavicle

☐

(d) Sternum and ribs

☐

3 Which of the following is the joint type found between the lumbar vertebrae? [1]

(a) Fused

☐

(b) Condylloid

☐

(c) Saddle

☐

(d) Gliding

☐

4 Which of the following muscles does NOT act at the hip joint? [1]

(a) Adductor longus

☐

(b) Teres major

☐

(c) Gluteus medius

☐

(d) Iliopsoas

☐

5 Which of the following muscle fibre types would be most beneficial for a shot putter? [1]

(a) Slow oxidative

☐

(b) Fast oxidative

☐

(c) Slow glycolytic

☐

(d) Fast glycolytic

☐

6 Which of the following is the correct timescale for the restoration of phosphocreatine stores? [1]

(a) 20 – 30 seconds

☐

(b) 2 – 3 minutes

☐

(c) 20 – 30 minutes

☐

(d) 1 – 2 hours

☐

7 Which of the following statements about the structures of the respiratory system is INCORRECT? [1]

(a) The trachea branches off into the left and right bronchi

☐

(b) Bronchioles contain smooth muscle and no supporting cartilage

☐

(c) The pharynx is also known as the voice box

☐

(d) The epiglottis prevents food from entering the trachea

☐

8 Which of the following is the correct order of blood flow through a section of the heart? [1]

**(a) Right atrium – right ventricle –
tricuspid valve – pulmonary artery**

☐

**(b) Right atrium – left atrium –
left ventricle – right ventricle**

☐

**(c) Right atrium – bicuspid valve –
left atrium – left ventricle**

☐

**(d) Right atrium – tricuspid valve –
right ventricle – pulmonary artery**

☐

9 Name the structure that regulates the flow of blood into the capillaries.

_____ **[1]**

10 Calculate the minute ventilation of an individual with a breathing frequency of 20 breaths per minute and a tidal volume of 700 ml.

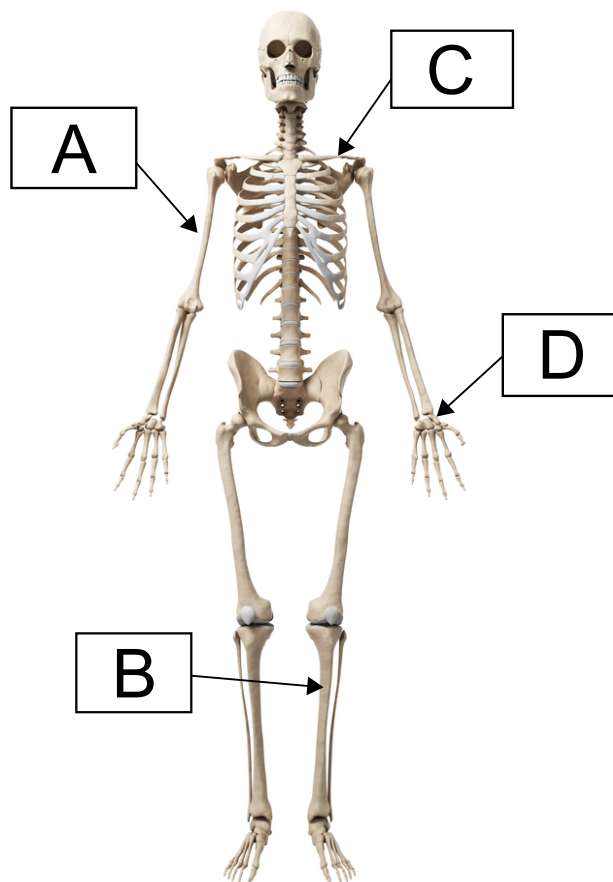
_____ **[1]**

SECTION B

Answer ALL the questions.

11 Fig. 11.1 shows an image of a skeleton.

Fig. 11.1



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

A _____

B _____

C _____

D _____

- 12 The following paragraph describes the functions of the skeleton. Complete the paragraph by filling in the missing words. [7]**

The skeleton is created to perform several functions. It protects vital _____ , for example the _____ protects the brain.

Long bones also manufacture _____ in their _____. These bones also provide a useful store of _____ .

The skeleton is jointed to allow _____ and also gives the body _____ and support.

13 Fig. 13.1 shows a performer in the UPWARD position of a bench dip.

Fig. 13.1



(a) Identify the joint positions at the hip, knee and elbow. [3]

Hip _____

Knee _____

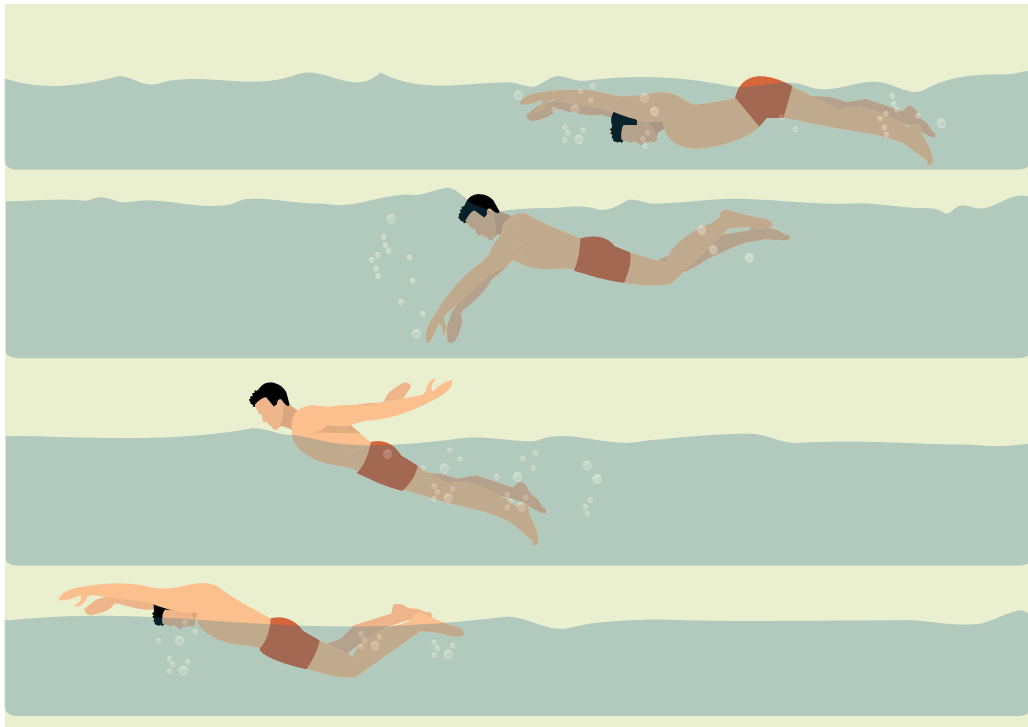
Elbow _____

(b) Complete the table below for the elbow during the **DOWNWARD** phase of the bench dip. [5]

Muscle function	Muscle acting	Type of contraction
Agonist		Eccentric
Antagonist		
	Erector spinae	

14 Fig. 14.1 shows a butterfly swimmer in action.

Fig. 14.1



(a) Name **THREE** muscles that act at the shoulder joint to assist the arm action of the swimmer during the butterfly stroke.

1 _____

2 _____

3 _____

[3]

(b) Explain how different intensities of exercise will determine which muscle fibre type will be used by a performer in a sporting activity of your choice.

[3]

(c) Describe TWO negative short-term effects of exercise on the muscular system.

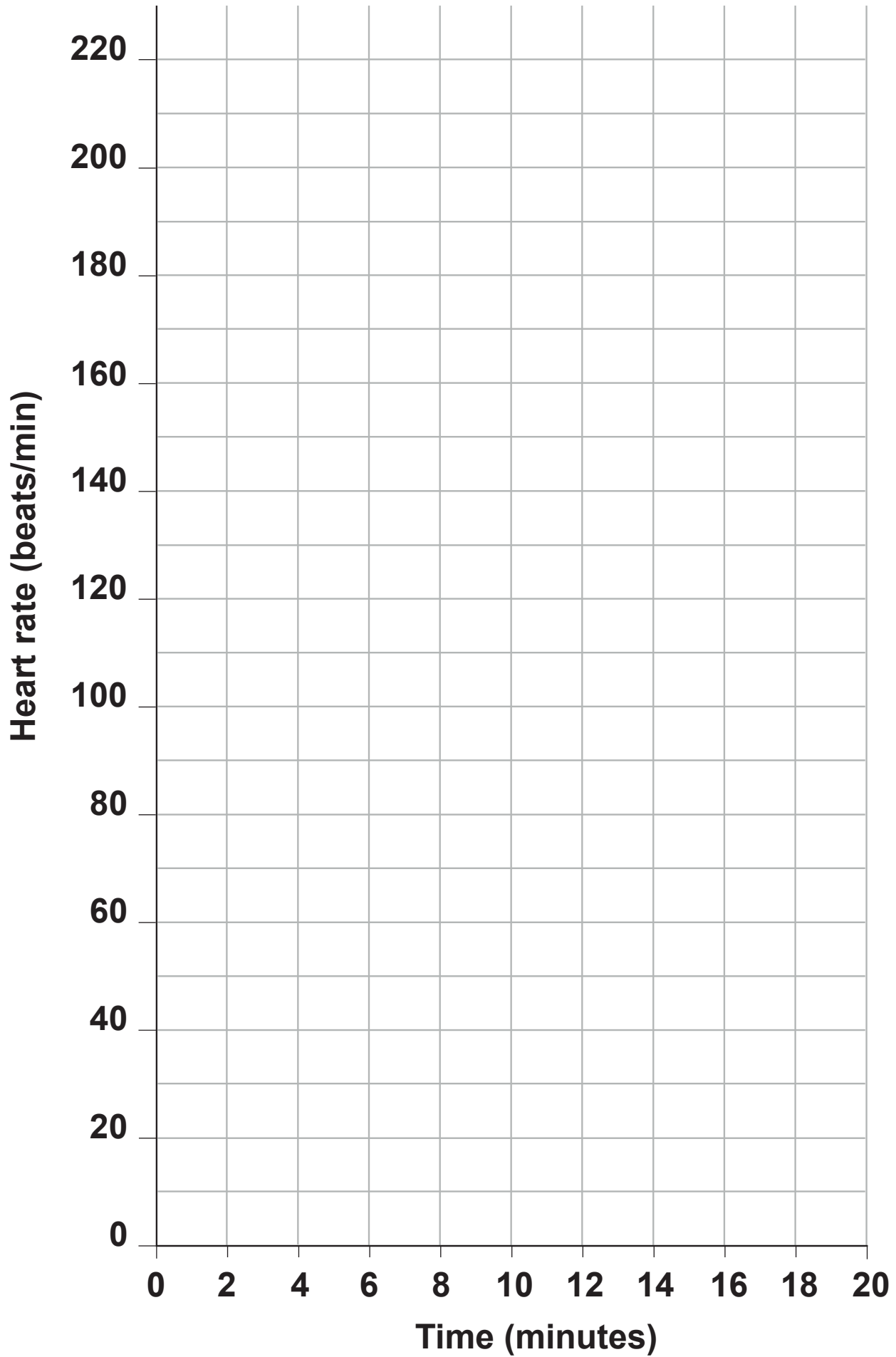
[2]

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- 15 (a) Sketch a line graph, using the grid opposite, to show the heart rate of a 20-year old individual who runs for 17 minutes at a steady pace on a treadmill, and then runs as fast as possible for the final 3 minutes. [4]**

- (b) Explain why the stroke volume of a trained athlete differs from the stroke volume of an untrained individual.**

[3]



16 Complete the table below to identify the blood vessels described. [3]

Blood vessel	Description
	Receive blood from the capillaries at low pressure.
	Carry blood under the highest pressure. Their walls extend and recoil under this pressure.
	Contain pocket valves to assist blood flow.

17 Describe the function of platelets and red blood cells.

Platelets _____

Red blood cells _____

[2]

- 18 During exercise additional muscles are used to increase tidal volume, helping a performer breathe more deeply.**

Explain how the contraction of the following muscles assists this process.

Sternocleidomastoid

Rectus abdominus

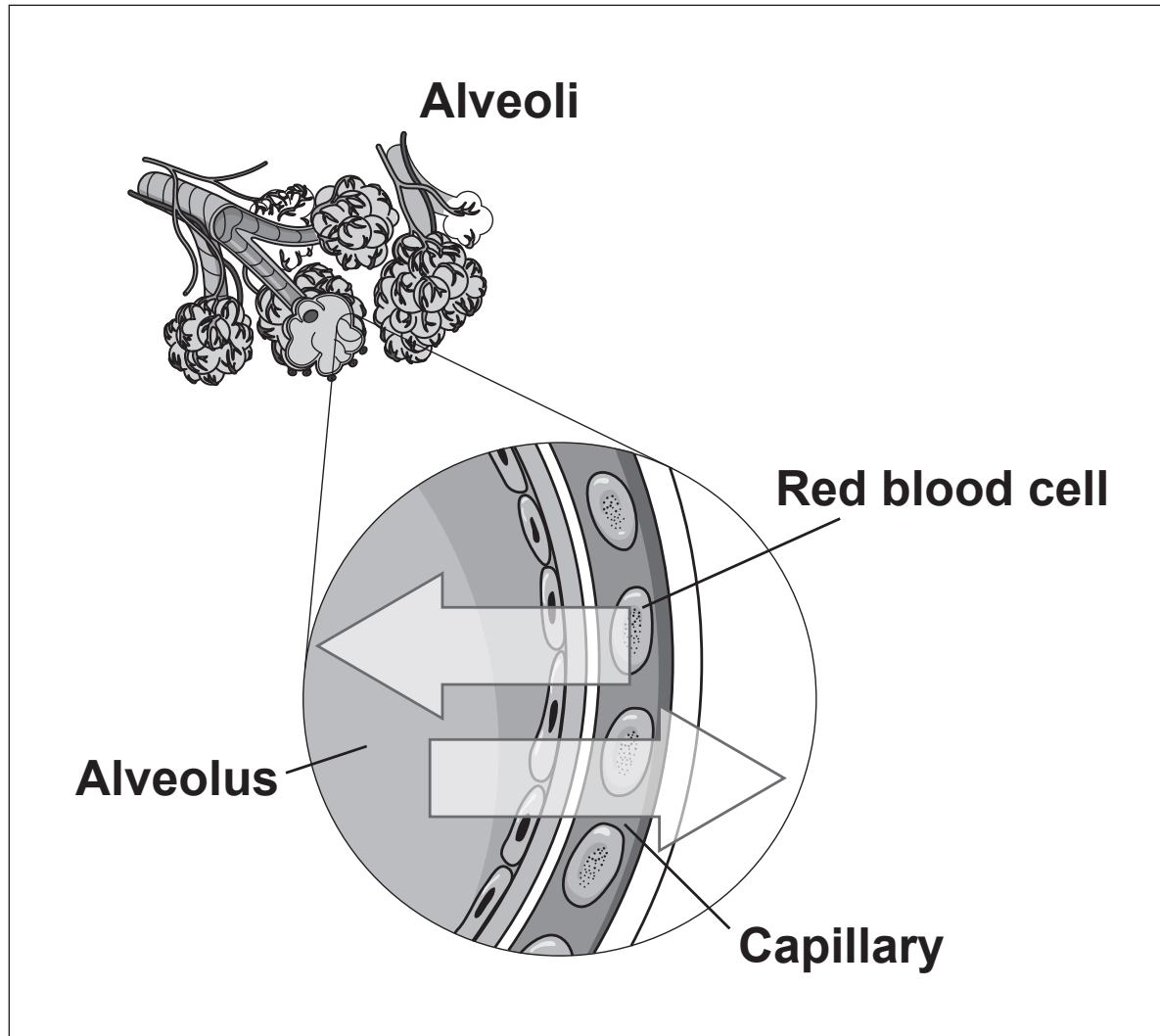
[4]

- 19 Describe the changes in tidal volume during recovery after exercise.**

[2]

20 Fig. 20.1 shows an image of the capillary networks at the alveoli.

Fig. 20.1



Explain the process of gaseous exchange at the alveoli by comparing the partial pressures of oxygen and carbon dioxide in the alveoli and the capillaries.

SECTION C

21* A marathon runner relies predominantly on the aerobic energy system during a race.

Describe the aerobic energy system and explain why it provides the majority of the energy needed during the race. [10]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional answer space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s) – for example 11 or 15(b).

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