

## Tuesday 11 January 2022 – 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

**C400/2201**



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
---	---	---	---	---	---	---	---

#### 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.

FOR EXAMINER USE ONLY	
Question No	Mark
Section A: 1-10	/10
Section B: 11	/7
12	/4
13	/3
14	/4
15	/4
16	/5
17	/6
18	/9
19	/3
20	/5
Section C: 21	/10
<b>Total</b>	<b>/70</b>

Answer **all** the questions.

**Section A**

Put a tick (✓) in the box next to the **one** correct answer for each of questions 1 to 8.

1 Which one of the following components of blood fights bacteria and viruses?

(a) Plasma

(b) Platelets

(c) Red blood cells

(d) White blood cells

[1]

2 Which one of the following muscles causes flexion at the shoulder?

(a) Deltoid

(b) Latissimus dorsi

(c) Pronator teres

(d) Trapezius

[1]

3 Which one of the following is **not** a fuel for the aerobic system?

(a) Carbohydrates

(b) Glucose

(c) Lipids

(d) Phosphocreatine

[1]

4 Which one of the following is the correct order of air flow into the lungs?

(a) Bronchiole → alveoli → bronchus

(b) Bronchiole → bronchus → alveoli

(c) Bronchus → trachea → alveoli

(d) Trachea → bronchus → bronchiole

[1]

5 Which one of the following correctly describes cardiac output?

(a) Number of contractions of the heart per minute

(b) Volume of blood pumped out of the atria per minute

(c) Volume of blood pumped out of the heart per minute

(d) Volume of blood pumped out of the ventricles per beat

[1]

6 Which one of the following is **not** a benefit of a cool down?

(a) Faster removal of lactic acid

(b) Reduced blood pooling

(c) Reduced flexibility

(d) Reduced muscle soreness

[1]

7 Which one of the following describes the concentration of a gas within a mixture of gases?

(a) Diffusion gradient

(b) Gaseous exchange

(c) Internal respiration

(d) Partial pressure

[1]

8 Which one of the following describes the recovery process for the ATP-PC/lactic system?

(a) Increases production of mitochondria

(b) Involves removal of lactic acid

(c) Involves restoration of glycogen

(d) Takes two to three minutes

[1]

9 Identify the gas produced as a by-product of the aerobic energy system.

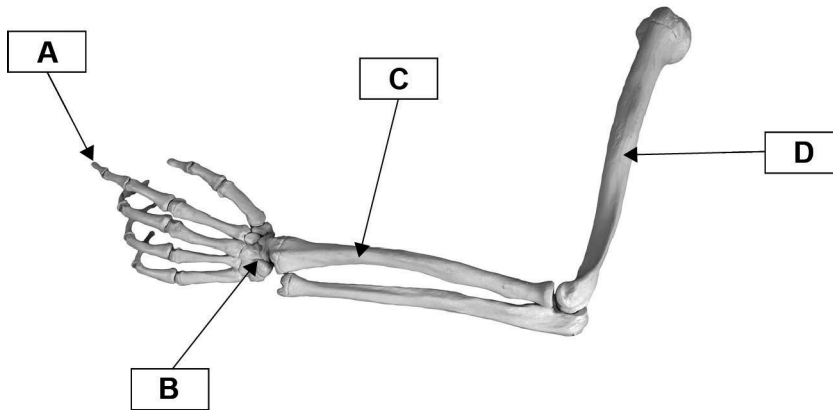
..... [1]

10 State the formula for calculating cardiac output (Q).

..... [1]

**Section B**

11 (a) Fig. 11 shows a diagram of the bones of the arm and hand.



**Fig. 11**

Identify A, B, C and D on the diagram.

- A .....
- B .....
- C .....
- D .....

[4]

(b) Complete the table to identify the joint movements in the practical examples.

Joint movement	Practical example
.....	Knee: Bending the knee in preparation to jump.
.....	Shoulder: Making circles with the arm to warm the shoulder muscles up.
.....	Ankle: Pointing the toes during a handstand.

[3]

12 Fig. 12 shows the major skeletal muscles of the leg.

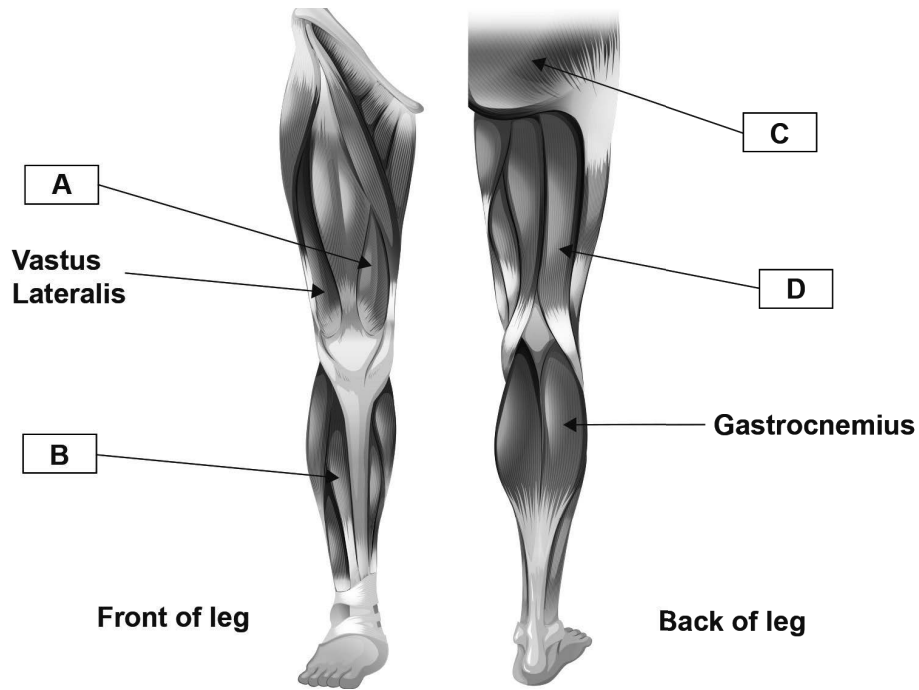


Fig. 12

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

- A .....
- B .....
- C .....
- D .....

[4]

13 Fig. 13 shows the upward phase of a pull up.

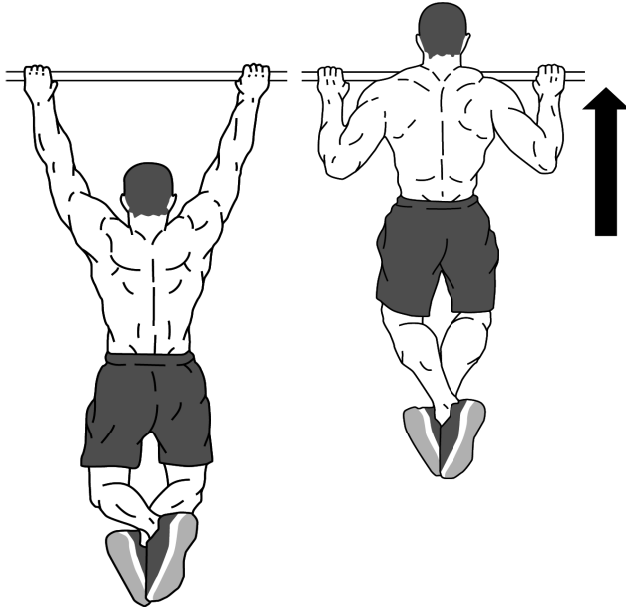


Fig. 13

Complete the table to analyse the movement at the elbow and wrist during the upward phase of the pull up.

Joint	Muscle function	Muscle acting	Type of muscle contraction
Elbow	Agonist	.....	.....
Wrist	Fixator	Pronator teres	.....

[3]

14 State which muscle fibre type would be mainly used in the following activities:

400 m race in athletics .....

10 km walking race .....

Tennis smash.....

50 m swimming race .....

[4]

**15** Describe **four** short-term effects of exercise on the muscular system.

- 1.....  
 .....  
 2.....  
 .....  
 3.....  
 .....  
 4.....  
 .....

**[4]**

**16** Complete the table to identify and describe the function of various structures of the heart.

Structure	Function
Bicuspid valve	1..... ..... .....
2.....	This chamber receives blood from the pulmonary vein.
3.....	The walls of this chamber contract to pump deoxygenated blood to the lungs.
Vena cava	4..... ..... .....
5.....	This valve closes to prevent blood flowing back into the left ventricle.

**[5]**



17 (a) Outline **three** differences between arteries and veins.

- 1.....  
.....
- 2.....  
.....
- 3.....  
.....

[3]

(b) As blood leaves the heart it passes through a series of blood vessels.

Other than arteries and veins, identify **three** different types of blood vessel in the body.

- 1.....
- 2.....
- 3.....

[3]

18 (a) The sentences below describe the mechanics of breathing during inspiration.

Complete the sentences by filling in the missing words.

The ..... and .....  
..... muscles contract.

The ..... move(s) upwards and outwards.

The volume of the .....  
..... increases.

This causes pressure in the lungs to .....

Air is drawn into the lungs.

[5]

(b) Fig. 18 shows a graph of minute ventilation before, during and after sub-maximal exercise.

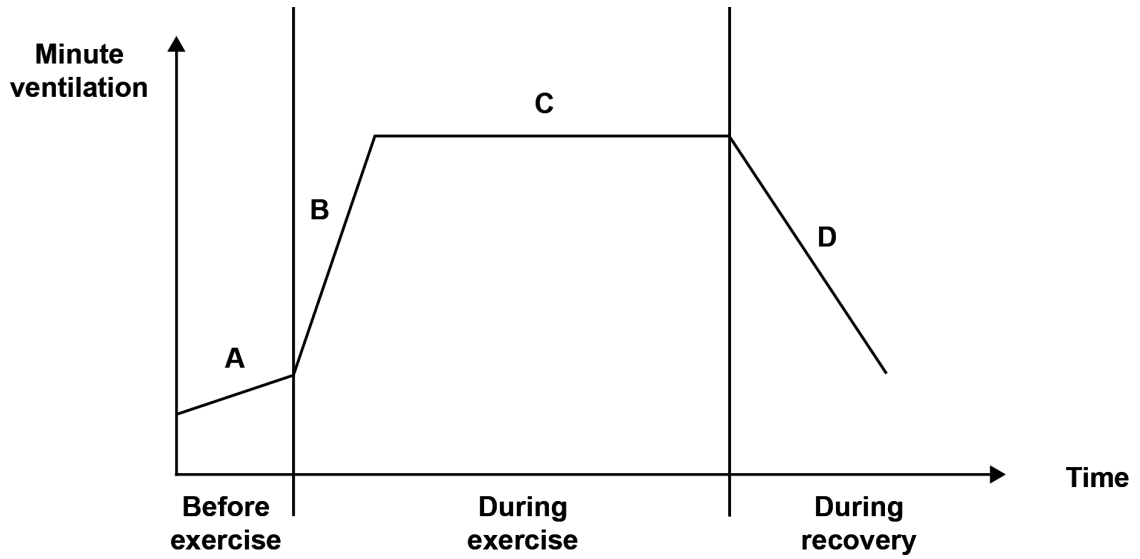


Fig. 18

Explain the changes in minute ventilation before exercise, during exercise and during recovery.

A - Before exercise

.....  
.....  
.....

B - Initial increase during exercise

.....  
.....  
.....

C - Steady-state plateau during exercise

.....  
.....  
.....

D - During recovery

.....  
.....  
.....

[4]

19 Describe **three** long-term effects of regular exercise on the respiratory system.

1.....  
.....  
2.....  
.....  
3.....  
.....

[3]

20 (a) Fig. 20 shows an example of an energy continuum.



Fig. 20

Show your knowledge of energy systems by placing the letters A, B and C to show where each of the following sporting activities would be on the energy continuum:

- A Gymnastics floor routine
- B Discus throw
- C 10 km swim.

[3]

(b) Justify your placement of B and C on the energy continuum.

.....  
.....  
.....  
.....  
.....  
.....

[2]



A series of horizontal dotted lines for writing.

**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 or 17(a).

A large vertical rectangular area containing 25 horizontal dotted lines for writing answers.

A series of horizontal dotted lines for writing, spanning the width of the page.



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