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| Friday 15 January 2021 | | |
| Morning (Time: 1 hour 30 minutes) | Paper Reference 31524H | |
| Sport Unit 1: Anatomy and Physiology | | |
| You do not need any other materials. | Total Marks | |

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and learner registration number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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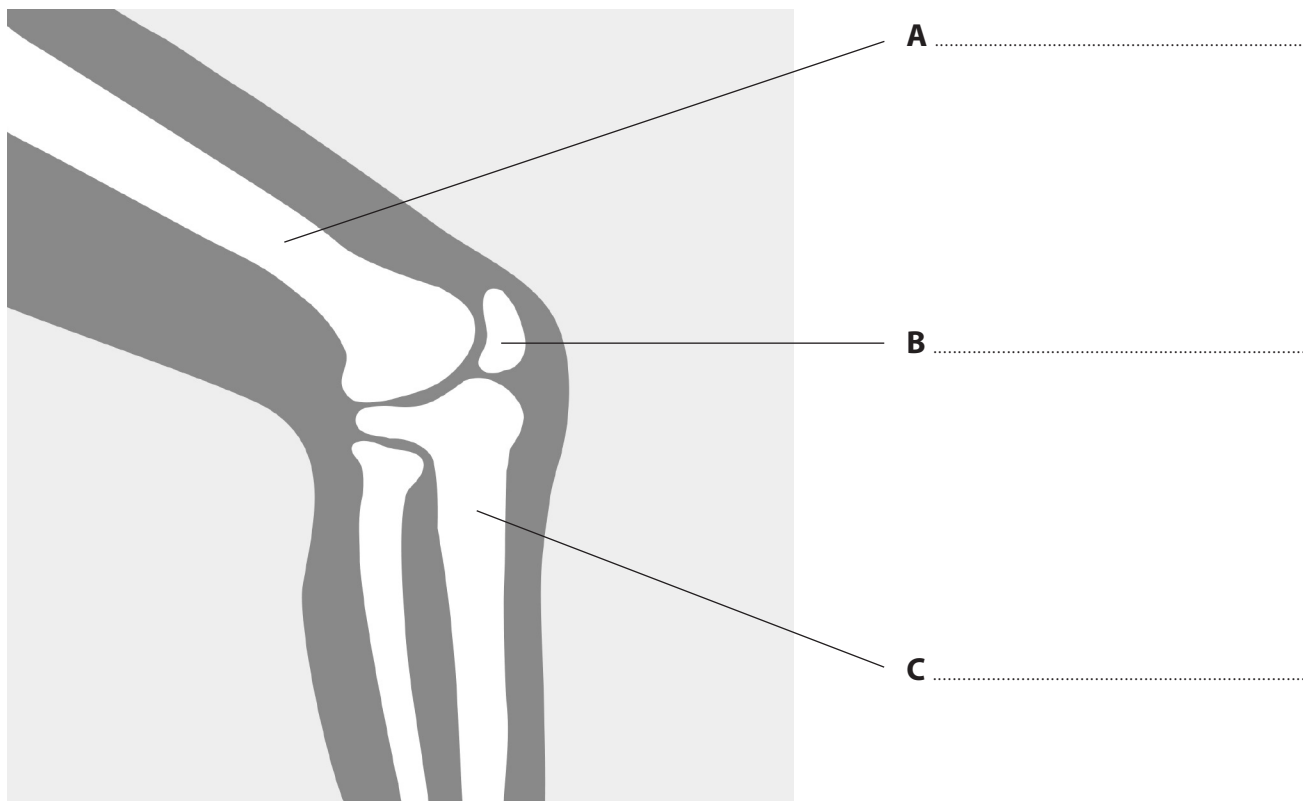
SECTION A: The Skeletal System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

Figure 1 shows the bones at the knee.

1 (a) Identify the bones labelled A–C in Figure 1.

(3)



Source: © Oleksandr Malysh/Shutterstock

Figure 1

Joints are classified according to the degree of movement they allow. One classification is a cartilaginous (slightly moveable) joint.

(b) Give **one** example of a cartilaginous (slightly moveable) joint.

(1)

(Total for Question 1 = 4 marks)

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Rose is a road runner. Two of the functions of the skeleton are to provide leverage and weight bearing.

- 2 (a) Explain how the skeletal functions of leverage and weight bearing are used when Rose runs.

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The skeletal system has a number of functions other than leverage and weight bearing.

- (b) State **two other** functions of the skeletal system.

(2)

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(Total for Question 2 = 6 marks)



3 Explain the function of ligaments.

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(Total for Question 3 = 3 marks)

TOTAL FOR SECTION A = 13 MARKS

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SECTION B: The Muscular System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

Figure 2 shows the muscles in the lower leg.

4 Identify the muscles labelled **A–C** in **Figure 2**.

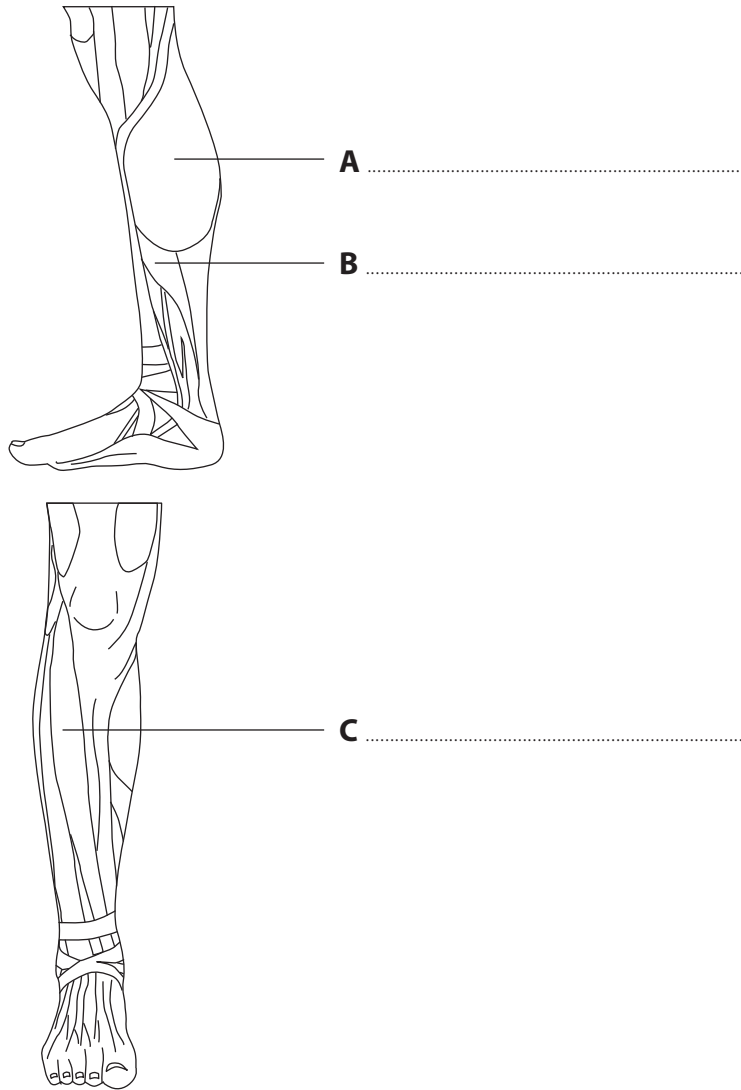


Figure 2

(Total for Question 4 = 3 marks)



5 State **three** characteristics of type I muscle fibres.

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(Total for Question 5 = 3 marks)

6 Describe the role of a synergist muscle.

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(Total for Question 6 = 2 marks)

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Marcellous is a sprinter.

Marcellous lifts heavy weights as part of his training regime.

- 7 (a) Explain the response of the muscular system from one session of lifting heavy weights.

(2)

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Over a period of time Marcellous's muscular system has adapted to lifting the heavy weights. This lifting has caused muscular hypertrophy.

- (b) Explain the impact of muscular hypertrophy on Marcellous's sprinting performance.

(3)

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(Total for Question 7 = 5 marks)

TOTAL FOR SECTION B = 13 MARKS



SECTION C: The Respiratory System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

8 Describe how the mechanism of breathing for **inspiration** changes during **exercise**.

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(Total for Question 8 = 4 marks)

9 Describe the role of the **internal** intercostal muscles during **expiration** when **exercising**.

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Dave is a tennis player. During the match he needs to supply his lungs with oxygen.

10 (a) Explain why gaseous exchange of oxygen is **faster** at the alveoli during exercise than at rest.

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Tennis matches can be over three hours long. Dave has taken part in a six-month endurance training programme so he will be able to play a full match.

- (b) Analyse the adaptations to Dave’s respiratory system after his six-month endurance training programme **and** the impact these adaptations will have on his tennis performance.

(6)

Dotted lines for writing the answer.

(Total for Question 10 = 10 marks)

TOTAL FOR SECTION C = 16 MARKS

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SECTION D: The Cardiovascular System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

Figure 3 shows the heart.

11 Identify the structures of the heart labelled **A–D** in **Figure 3**.

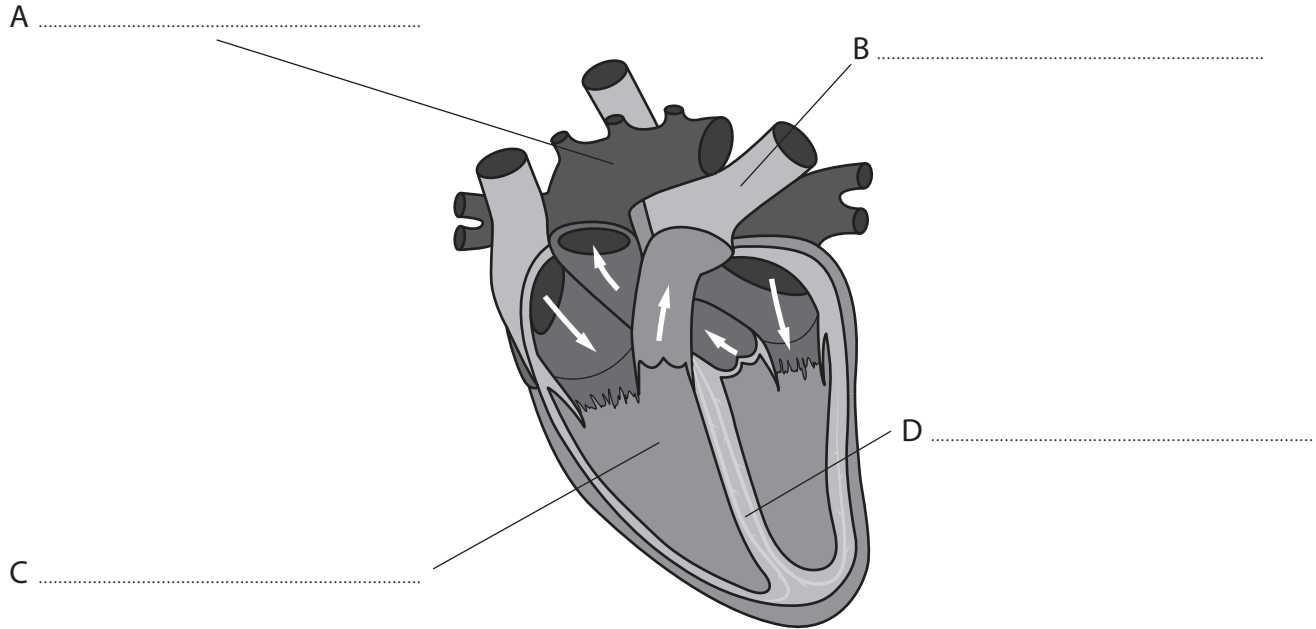


Figure 3

(Total for Question 11 = 4 marks)

12 Describe the role of semi-lunar valves.

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(Total for Question 12 = 2 marks)



Steph is a hockey player. She has been playing for several years and there have been cardiovascular adaptations in her body. One of these adaptations is an increase in blood volume.

13 (a) Explain how an increase in blood volume impacts on Steph's hockey performance. (4)

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(b) State what happens to Steph's stroke volume when she is playing hockey. (1)

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Steph's cardiovascular system has adapted as a result of playing hockey.

- (c) Analyse how cardiac hypertrophy and capillarisation of skeletal muscle and alveoli affect Steph's performance in a hockey match.

(6)

Area containing horizontal dotted lines for writing the answer to question (c).

(Total for Question 13 = 11 marks)

TOTAL FOR SECTION D = 17 MARKS

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SECTION E: Energy Systems for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

Figure 4 shows a graph of energy system contributions to exercise.

14 Identify the energy systems labelled **A–C** in **Figure 4**.

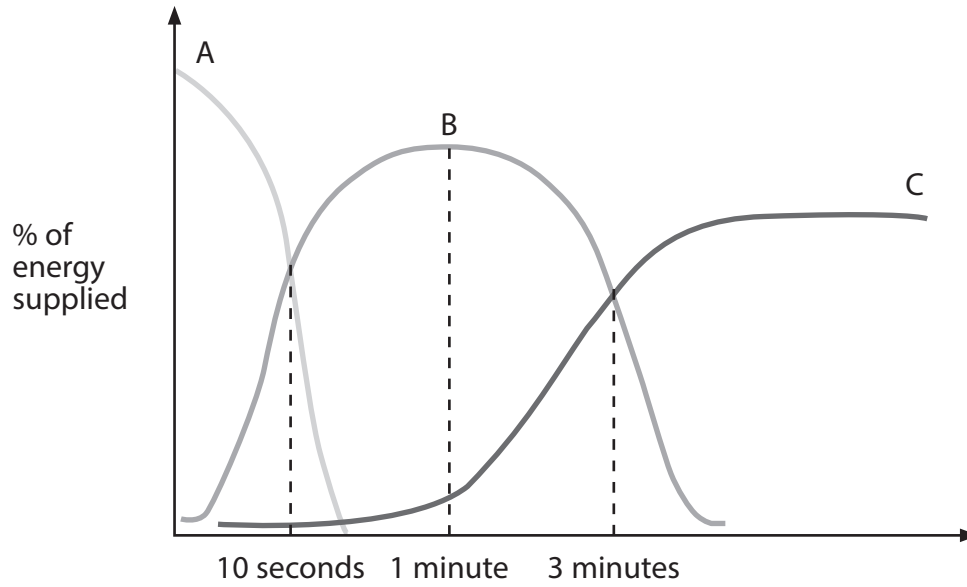


Figure 4

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(Total for Question 14 = 3 marks)

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Crystal is a long-distance cyclist. Crystal's aerobic system has adapted during her training regime. One of these adaptations is that Crystal can now use fats as an energy source more quickly.

15 Explain **two other** adaptations there have been in Crystal's aerobic energy system **and** the impact of these adaptations on her performance.

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SECTION F: Interrelationships between Body Systems for Sports Performance.

Answer the question. Write your answer in the space provided.

The warm up is a fundamental part of a team’s preparation that takes place before a game. Theo is a netball coach and his team warm up before every game. In their warm up, team members do some light jogging around the court, dynamic stretching and more intense drills with the ball.

17 Analyse the responses of the muscular system and cardiovascular system to the netball warm up **and** how these responses impact on performance.

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(Total for Question 17 = 8 marks)

TOTAL FOR SECTION F = 8 MARKS

TOTAL FOR PAPER = 80 MARKS



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