

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Learner Registration Number

Pearson BTEC
Level 3 Nationals
Certificate

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Friday 18 January 2019

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 regions of the vertebral column.

1 Identify the regions labelled **A** and **C**.

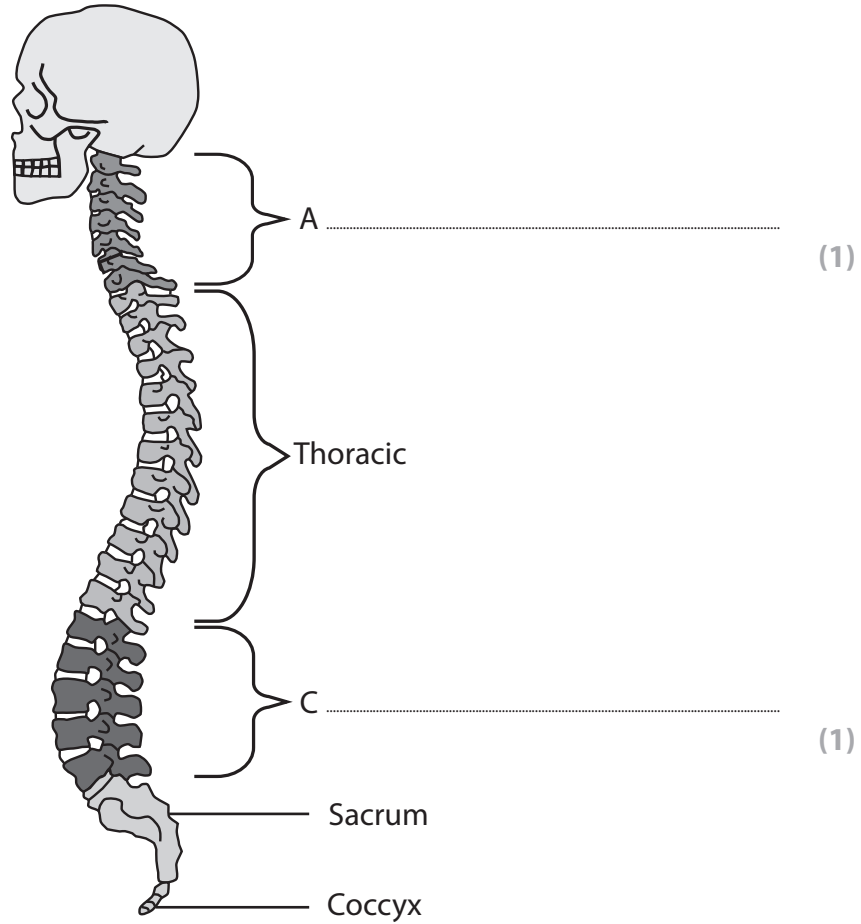


Figure 1

(Total for Question 1 = 2 marks)

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A flat bone is one type of bone. One function of a flat bone is to protect vital organs of the body.

2 Complete **Table 1** by:

- (a) giving **two** other types of bone in Column A
- (b) giving **one** function of each type of bone in Column B.

An example has been provided.

	Column A	Column B
	(a) Type of bone	(b) Function of the bone given in Column A
Example	Flat bone	Protect vital organs
1	(1)	(1)
2	(1)	(1)

Table 1

(Total for Question 2 = 4 marks)



3 Give **one** response of the skeletal system when participating in a single session of weight-bearing exercise.

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(Total for Question 3 = 1 mark)

The knee is a hinge joint.

4 Describe the range of movement at the knee.

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(Total for Question 4 = 2 marks)

Carys is a mountain walker. She is experiencing pain in her knees. Her doctor has diagnosed her condition as arthritis.

5 Explain why arthritis causes pain.

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(Total for Question 5 = 3 marks)

TOTAL FOR SECTION A = 12 MARKS



SECTION B: The Muscular System for Sports Performance

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

Figure 2 shows the posterior view of the skeletal muscles of the body.

6 Identify the muscles labelled **A** and **B**.

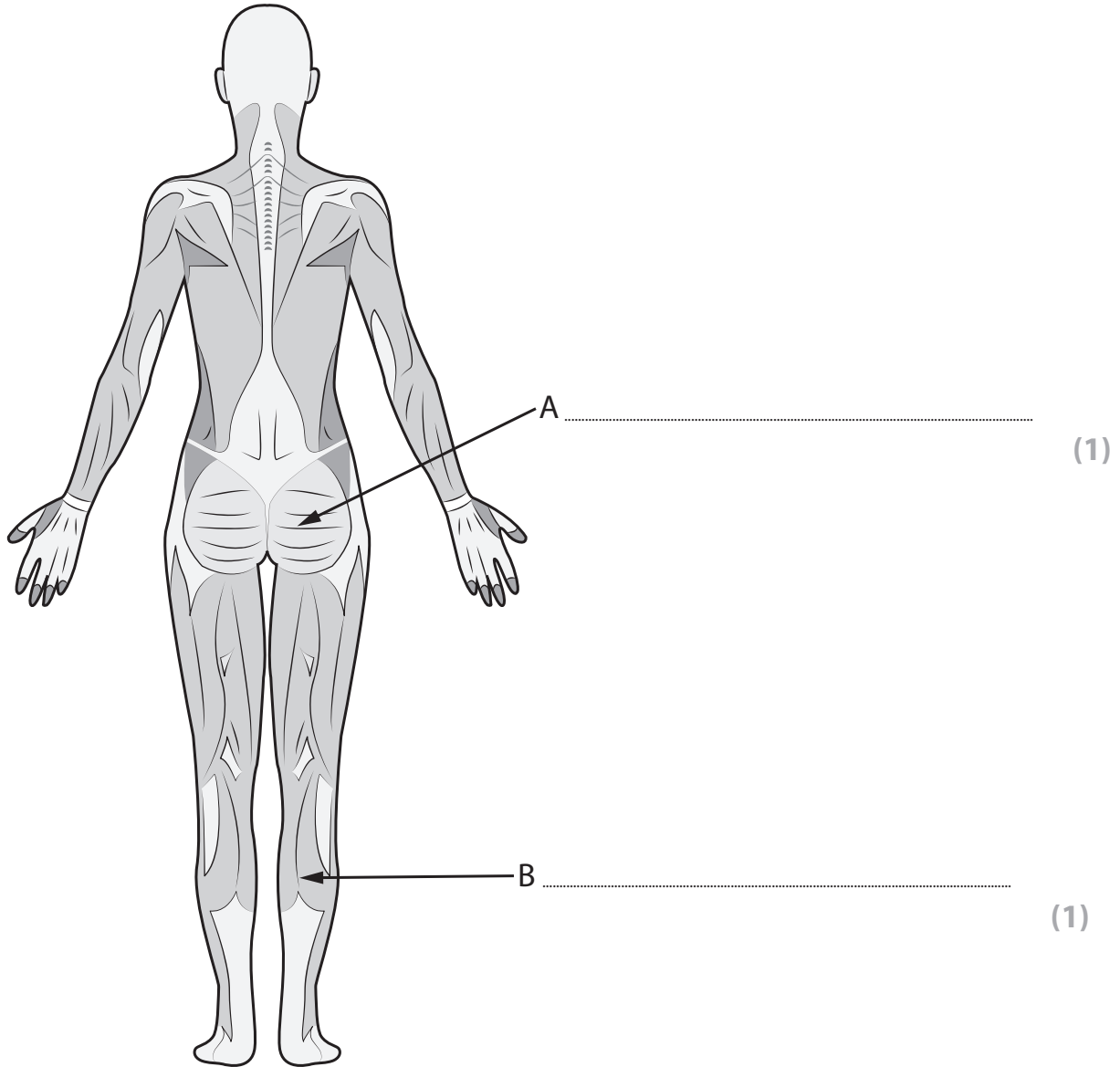


Figure 2

(Total for Question 6 = 2 marks)

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One characteristic of cardiac muscle is that it is non-fatiguing.

7 (a) State **one other** characteristic of cardiac muscle. (1)

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(b) State **one** reason why it is important that cardiac muscle is non-fatiguing. (1)

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(Total for Question 7 = 2 marks)

Zoe competes in long-distance swimming races.

8 (a) Explain why type I muscle fibres are used in long-distance swimming races. (3)

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One of Zoe's training exercises is a bicep curl.

Figure 3 shows the starting and finishing position of the upward phase of a bicep curl.



Source: © Nicholas Piccillo/Shutterstock

Starting position

Finishing position

Figure 3

(b) Describe the action of the antagonistic muscle pair at the elbow allowing Zoe to complete the upward phase of the bicep curl in **Figure 3**.

(4)

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During Zoe's weight training session her muscles become more pliable and increase in temperature.

(c) Explain **one other** response of her muscles to a single weight training session.

(3)

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(Total for Question 8 = 10 marks)

TOTAL FOR SECTION B = 14 MARKS

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SECTION C: The Respiratory System for Sports Performance

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

Figure 4 shows the structure of the respiratory system.

9 Identify the structures labelled **A** and **B**.

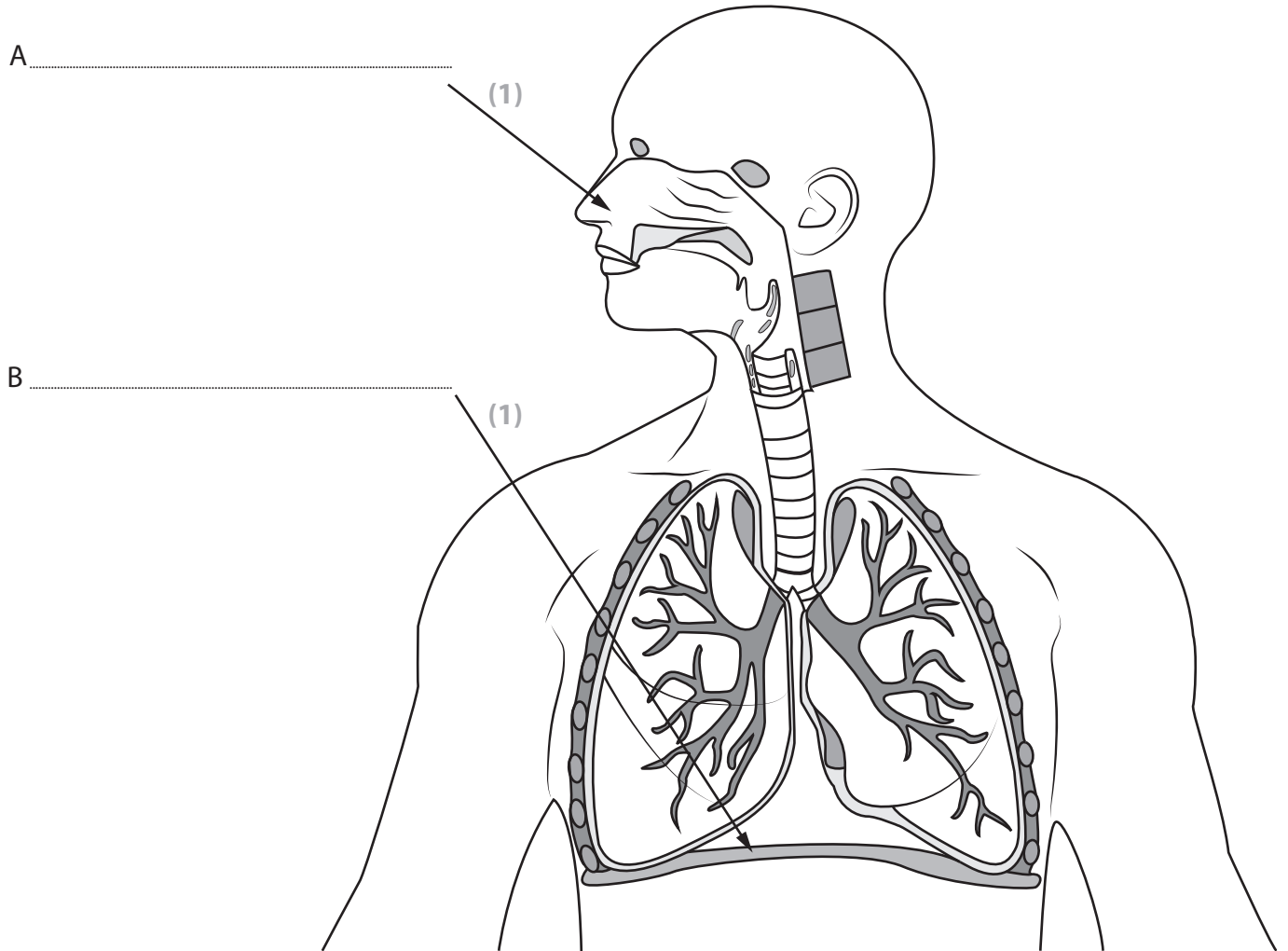


Figure 4

(Total for Question 9 = 2 marks)

10 State what is meant by an increase in breathing rate.

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(Total for Question 10 = 1 mark)

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Increased breathing rate is one response of the respiratory system when starting exercise.

11 State **one other** response of the respiratory system when starting exercise.

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(Total for Question 11 = 1 mark)

The medulla oblongata plays an important role in the neural control of breathing during exercise.

12 Describe how the medulla oblongata increases breathing rate.

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(Total for Question 12 = 2 marks)

Asthma is a condition that affects the respiratory system.

13 Explain **one** way in which asthma affects breathing.

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(Total for Question 13 = 3 marks)



SECTION D: The Cardiovascular System for Sports Performance

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

15 Describe the flow of blood from the right atrium through the heart to the pulmonary artery.

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(Total for Question 15 = 3 marks)

Heart rate increases in response to a single exercise session.

16 Give **two other** responses of the cardiovascular system to a single exercise session. (1)

1 (1)

2 (1)

(Total for Question 16 = 2 marks)

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Figure 5 is an incomplete flow diagram of the structures within the heart that control the cardiac cycle.

17 (a) Identify the **two** structures needed to complete the flow diagram shown in **Figure 5**.

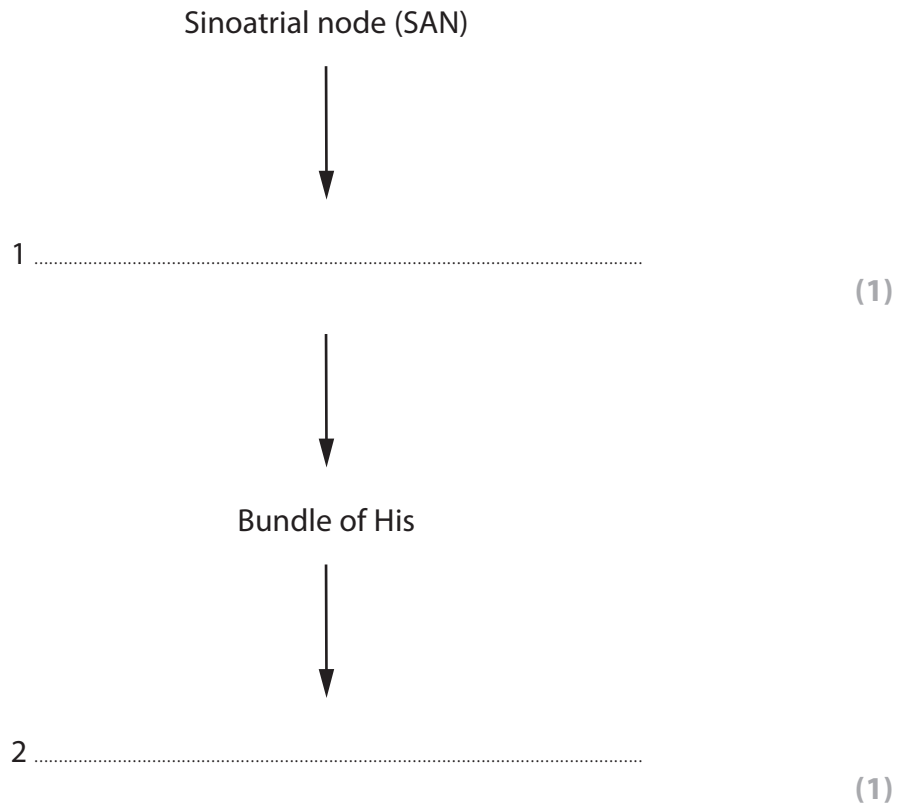


Figure 5

(b) Describe the role of the sinoatrial node (SAN). (2)

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(Total for Question 17 = 4 marks)



One component of blood is platelets. The function of platelets is to clot the blood to prevent bleeding.

18 Complete **Table 2** by:

- (a) giving **two other** components of blood in Column A
- (b) giving **one** function of each component of blood in Column B.

An example has been provided.

	Column A	Column B
	(a) Component of blood	(b) Function of the component given in Column A
Example	Platelets	Clot the blood to prevent bleeding
1	(1)	(1)
2	(1)	(1)

Table 2

(Total for Question 18 = 4 marks)

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Christine is an endurance cyclist. As part of her training for a 140-mile race Christine undertakes a 100-mile bike ride once a week. As a result of this training, one of the adaptations to Christine's cardiovascular system is an increase in her blood volume.

19 Analyse the effects that an increase in blood volume could have on Christine's cycling performance.

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(Total for Question 19 = 6 marks)

TOTAL FOR SECTION D = 19 MARKS



SECTION E: Energy Systems for Sports Performance

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

Figure 6 shows Dave performing in a shot put event.



Source: © Jamie Roach/Shutterstock

Figure 6

Dave uses the ATP-PC energy system when putting the shot.

20 (a) State **one** chemical source used in the ATP-PC system.

(1)

(b) Explain **one** reason why the ATP-PC energy system is used when putting the shot.

(3)

(Total for Question 20 = 4 marks)



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Sports performers can experience hypoglycaemic attacks.

21 Explain **one** possible cause of a sports performer experiencing a hypoglycaemic attack.

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(Total for Question 21 = 2 marks)



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Freddie is a badminton player, he has been training for five years. Over this time his aerobic energy system has adapted.

22 Assess the impact of adaptations to the aerobic energy system on Freddie’s badminton performance.

Dotted lines for writing the answer to Question 22.

(Total for Question 22 = 6 marks)

TOTAL FOR SECTION E = 12 MARKS



SECTION F: Interrelationships between Body Systems for Sports Performance

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

Khalid is a 1500m runner who is in the middle of a race. He decides that he wants to increase his pace and therefore needs a good supply of oxygen to his working muscles.

23 Analyse how the responses of Khalid’s respiratory and muscular systems allow him to increase and maintain his pace.

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(Total for Question 23 = 8 marks)

TOTAL FOR SECTION F = 8 MARKS
TOTAL FOR PAPER = 80 MARKS

