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<b>Pearson BTEC</b> <b>Level 3 Nationals</b> <b>Certificate</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">           Centre Number  <div style="display: flex; border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> </div> </div> <div style="width: 45%;">           Learner Registration Number  <div style="display: flex; border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> <div style="flex: 1; border: 1px solid black; width: 15%;"></div> </div> </div> </div>
<h1 style="margin: 0;">Sport</h1> <h2 style="margin: 0;">Unit 1: Anatomy and Physiology</h2>	
Monday 21 May 2018 – Morning <b>Time: 1 hour 30 minutes</b>	Paper Reference <b>31524H</b>
<b>You do not need any other materials.</b>	Total Marks <div style="border: 1px solid black; height: 30px; width: 100%; margin-top: 5px;"></div>

### 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 ►

**P54126RA**

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## SECTION A

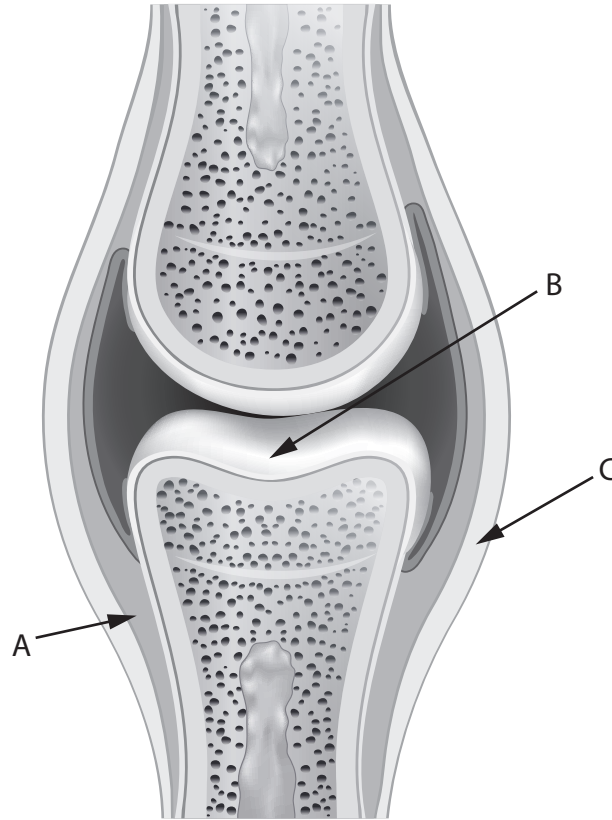
### The Skeletal System for Sports Performance

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

**Figure 1** shows a synovial joint.

- 1 (a) Name the components of the synovial joint labelled A–C in **Figure 1**.

(3)



(Source: © Tefi/Shutterstock)

**Figure 1**

A .....

B .....

C .....



(b) Synovial fluid is a thick liquid found in synovial joints.

Give **three** functions of synovial fluid.

(3)

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(Total for Question 1 = 6 marks)



Michael is a high jumper. He has recently experienced severe pain and his doctor has diagnosed postural deviations.

- 2
- Complete the table by:
- (a) giving **two** types of postural deviation in Column A.
- (2)
- (b) giving **one** characteristic of each type of postural deviation in Column B.
- (2)

	Column A	Column B
	Type of postural deviation	Characteristic of postural deviation
1		
2		

(Total for Question 2 = 4 marks)

- 3
- (a) Give an example of a flat bone.
- (1)
- (b) State the function of a flat bone.
- (1)

(Total for Question 3 = 2 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.

4 State **two** characteristics of cardiac muscle.

1 .....

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2 .....

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(Total for Question 4 = 2 marks)

5 (a) Give the meaning of the term 'isometric contraction'.

(1)

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(b) Give **one** example of a sporting action that requires an isometric contraction.

(1)

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(Total for Question 5 = 2 marks)

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P 5 4 1 2 6 R A 0 5 2 4

Jane is an 800m runner. One of the adaptations of her training is an increase in the size and number of her mitochondria.

6 (a) (i) State the function of mitochondria.

(1)

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(ii) Explain why an increase in the number of mitochondria is beneficial to Jane's 800m performance.

(4)

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One reason Type IIa muscle fibres are important to an 800m runner's performance is that they are more resistant to fatigue than Type IIx muscle fibres.

(b) Explain one **other** reason that Type IIa muscle fibres are important to an 800m runner's performance.

(3)

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(Total for Question 6 = 8 marks)

TOTAL FOR SECTION B = 12 MARKS

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## SECTION C

### The Respiratory System for Sports Performance

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

- 7 Name the structures, A–C, described in **Table 1**.

Structure	Description
A .....	A flap of cartilage at the base of the tongue, which prevents food from entering the windpipe.
B .....	Large single tube strengthened by rings of cartilage.
C .....	Tiny airways that carry oxygen to the alveoli.

**Table 1**

(Total for Question 7 = 3 marks)



P 5 4 1 2 6 R A 0 7 2 4

8 Explain the role of the diaphragm during inspiration and expiration.

Inspiration

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Expiration

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(Total for Question 8 = 4 marks)

9 (a) State the meaning of the term 'tidal volume'.

(1)

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Increased tidal volume is one immediate response of the respiratory system to exercise.

(b) State **one other** response of the respiratory system when starting sport or exercise

(1)

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(Total for Question 9 = 2 marks)



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(Total for Question 10 = 6 marks)

**TOTAL FOR SECTION C = 15 MARKS**



## SECTION D

### The Cardiovascular System for Sports Performance

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

One of the functions of the cardiovascular system is to deliver oxygen to the working muscles.

**11** Describe, in the correct order, the flow of **oxygenated blood** through the heart.

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(Total for Question 11 = 4 marks)

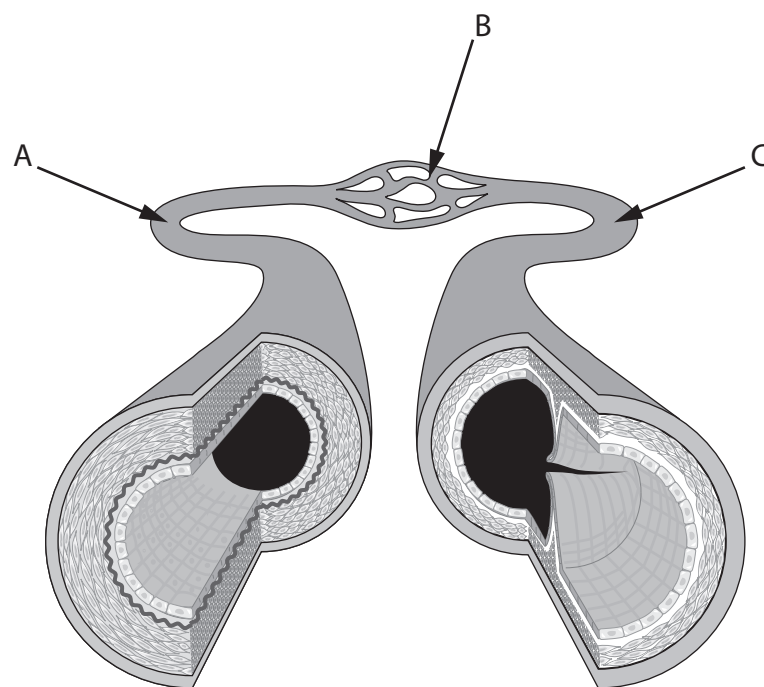


P 5 4 1 2 6 R A 0 1 1 2 4

**Figure 2** shows the various types of blood vessel.

**12** Name the blood vessels labelled A–C in **Figure 2**.

(3)



(Source: © Blamb/Shutterstock)

**Figure 2**

A .....

B .....

C .....

(Total for Question 12 = 3 marks)



Nadia is a triathlete. When on a training run some of her blood vessels vasodilate and some vasoconstrict.

**13** Explain why vasodilation and vasoconstriction help Nadia to perform in the triathlon.

Vasodilation -

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Vasoconstriction -

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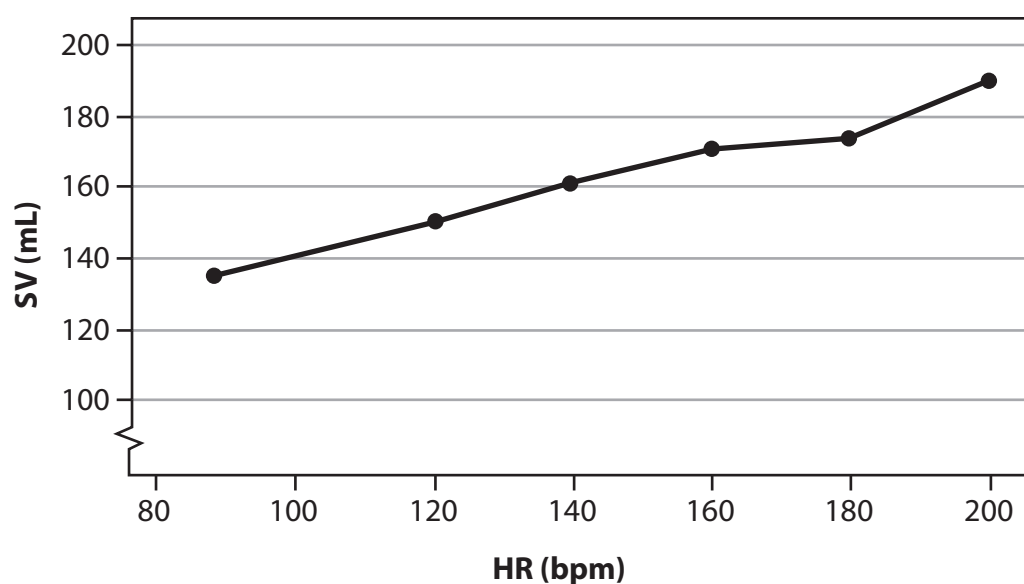
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**(Total for Question 13 = 4 marks)**



P 5 4 1 2 6 R A 0 1 3 2 4

**Figure 3** shows Nadia's heart rate and stroke volume during the running training session.



**Figure 3**

**14** Explain the effects of exercise intensity on cardiac output.

(3)

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**(Total for Question 14 = 3 marks)**



**15** Analyse the effect of cardiac hypertrophy on Nadia's performance in the triathlon.





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(Total for Question 15 = 6 marks)

**TOTAL FOR SECTION D = 20 MARKS**





**SECTION E**

**Energy Systems for Sports Performance**

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

**16** Describe how ATP is broken down for muscular contraction and then resynthesised.

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**(Total for Question 16 = 4 marks)**



P 5 4 1 2 6 R A 0 1 7 2 4

**17** Describe the process of anaerobic glycolysis.

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**(Total for Question 17 = 3 marks)**

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(Total for Question 18 = 6 marks)

**TOTAL FOR SECTION E = 13 MARKS**



## SECTION F

### Interrelationships between Body Systems for Sports Performance

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

**Figure 5** shows Joe in action during his race.



**Figure 5**

- 19** Analyse how the muscular system and the skeletal system work together to carry out the action of the leading leg which is shaded in **Figure 5**.

(8)

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(Total for Question 19 = 8 marks)

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



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