| Write your name | e here | Other name | es |
|---|--|------------|------------------------|
| | | | |
| Pearson BTEC Level 3 Nationals Certificate | Centre Number | Learner Re | egistration Number |
| Spo Unit 1: A | rt Anatomy and Physio | logy | |
| 1 | y 7 June 2017 – Morning ur 30 minutes | | Paper Reference 31524H |
| You do not r | 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 90.
- 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 ▶



(2)

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 (a) Identify the regions labelled **B** and **E**.

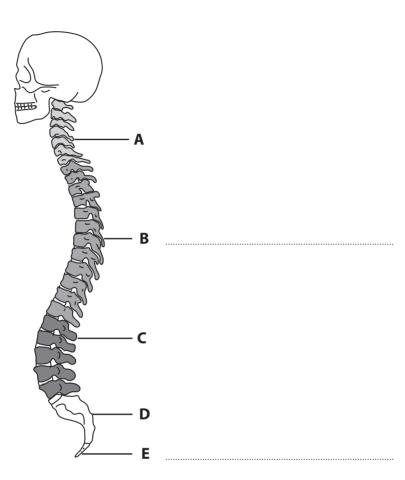


Figure 1

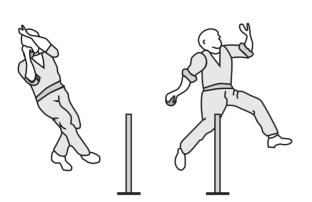
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| (b) Describe the process of bone growth. | (4) |
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| (Tatalfan Ossatian 1 - 6 ma | |
| (Total for Question 1 = 6 ma | irks) |
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Figure 2 shows Alastair bowling at cricket.

The synovial joint of the shoulder allows him to complete the bowling action.



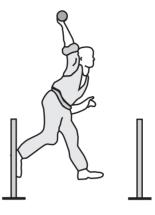




Figure 2

2 Analyse how the structure of Alastair's shoulder joint allows him to complete the bowling action.

(Total for Question 2 = 6 marks)

TOTAL FOR SECTION A = 12 MARKS

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SECTION B: The Muscular System for Sports Performance Answer ALL questions. Write your answers in the spaces provided.

| Skeletal muscle is one type of muscle tissue. | | |
|---|---|------------|
| 3 | State one other type of muscle tissue and its location in the body. | |
| | | |
| | (Total for Question 3 = | = 2 marks) |
| So | Sonia is a footballer playing in a cup final. | |
| Th | The final has gone into extra time and she develops cramp in her leg. | |
| 4 | (a) Explain how cramp will affect Sonia's performance. | (4) |
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| Explain how an increase in myoglobin stores will benefit Sonia's football | |
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| performance. | (4) |
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Figure 3 shows Sonia performing press-ups as part of her pre-season muscular training programme.

(c) Analyse the antagonistic muscular contractions used to perform **both** the upward and downward phase of the press-up.

(6)





Upward phase

Downward phase

Figure 3

| TOTAL FOR SECTION B = 16 MARKS |
|-----------------------------------|
| (Total for Question 4 = 14 marks) |
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SECTION C: The Respiratory System for Sports Performance Answer ALL questions. Write your answers in the spaces provided.

| | | (Total for Question 5 = | 2 marks) |
|---|-----|---|----------|
| | (b) | Give a typical value of pulmonary ventilation (VE) for a performer at rest. | (1) |
| | | | |
| | | | |
| 5 | (a) | State the meaning of the term 'pulmonary ventilation' (VE). | (1) |

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| | cos is a marathon runner. | |
|---|--|-----|
| (| a) Explain the role of Marcos's internal and external intercostal muscles during inspiration and expiration. | |
| | | (4) |
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| (| Gas exchange occurs so that Marcos's body receives oxygen from the air he breaths in. | |
| | b) Explain the process of gaseous exchange of oxygen at the alveoli during | |
| | | (4) |
| | b) Explain the process of gaseous exchange of oxygen at the alveoli during | (4) |
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| endurance training programme. | espiratory system at the end of his six-month |
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| | (6) |
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| | (Total for Question 6 = 14 marks) |
| | (Total for Question 0 = 14 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.

Carbon dioxide (CO₂) is a by-product of respiration

| (a) Describe how carbon dioxide (CO ₂) is transported in the blood. | (2) |
|--|----------|
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| (b) Explain how carbon diavida (CO) is removed from the body | |
| (b) Explain how carbon dioxide (CO ₂) is removed from the body. | (5) |
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| (Total for Question 7 = 7 | 7 marks) |
| State the blood vessel that transports oxygenated blood from the left ventricle. | |
| (Total for Question 8 = | 1 mark) |



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| Jose is stressed about a National Mountain Biking competition. | | | |
|---|-----|--|--|
| He has been to see his doctor and as part of the medical check the doctor took his blood pressure. | | | |
| 9 (a) (i) State the meaning of the term 'blood pressure'. | (1) | | |
| (ii) Give a typical blood pressure value for someone suffering with hypertension. | (1) | | |
| Jose fell of his bike two weeks ago and he cut his arms and legs. These cuts soon healed due to the clotting action of the blood. | | | |
| (b) Describe the process of blood clotting. | (5) | | |
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| (c) State the part of the blood that fights infections. | (1) | | |
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| Jose cycles 60 miles per week, as part of his training. His stroke volume will increase because of this training. | |
|--|-------|
| (d) Analyse how an increased stroke volume will help to improve the long-term quality of Jose's cycling performance. | |
| | (6) |
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| (Total for Question 9 = 14 m | arks) |
| TOTAL FOR SECTION D = 22 MA | ARKS |
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SECTION E: Energy Systems for Sports Performance Answer ALL guestions. Write your answers in the spaces provided.

| Answer ALL questions. Write your answers in the spaces provided. | | |
|---|-----|--|
| Clarissa is a time trial cyclist. She has to cycle 25 miles as quickly as she can. | | |
| 10 (a) Describe how the ATP-PC system re-synthesizes ATP during Clarissa's ride. | | |
| | (5) | |
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Clarissa has just completed her time trial.

Figure 4 shows Clarissa's rest, exercise and recovery period.

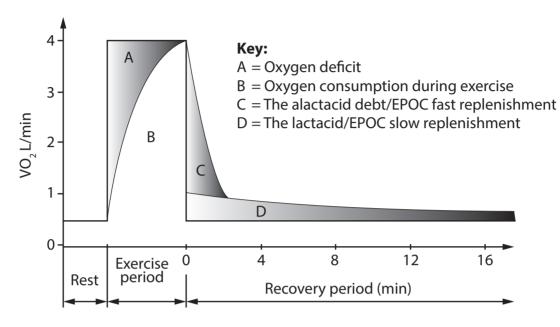


Figure 4

(b) Explain the section labelled C, that is the alactacid component of Clarissa's recovery process.

(5)

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| (c) Evaluate the effects of oxygen and fuel energy system Clarissa uses in a race. | , , |
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| | (6) |
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| | (Total for Question 10 = 16 marks) |
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| | TOTAL FOR SECTION E = 16 MARKS |

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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.

Dave is a rugby coach and his team warm up before every game. In their warm-up they do some light jogging, dynamic stretching and more intense drills.

| Analyse the response | or the masee | nar and carar | ovuscului sy. | terns to the | . waiiii ap. | (8) |
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| (Total for Question 11 = 8 marks) |
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| TOTAL FOR PAPER — 00 MARKS |
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