BTEC

Pearson BTEC Level 3 Nationals

Write your name here

Surname	**Forename**

Learner Registration Number | **Centre Number** | **Level 3**

Sport

Unit 1: Anatomy and Physiology

Certificate/Extended Certificate/Foundation Diploma/Diploma/Extended Diploma

Sample Assessment Materials for first teaching September 2016
Time: 1 hour 30 minutes

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 grey boxes
  – 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.

Paper reference
31524H
S51969A

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Turn over ▶

PEARSON

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

Figure 1 shows the bones of the foot.

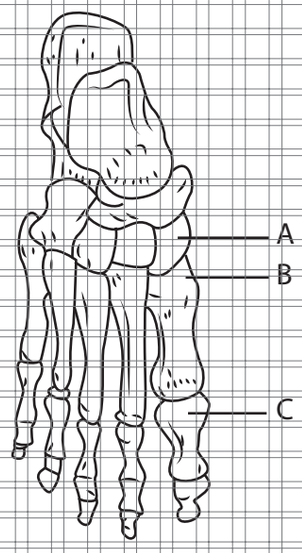


Figure 1

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

3 marks

A .....

B .....

C .....

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(b) State the function of the following **three** types of bone:

3 marks

Long .....

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Short .....

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Flat .....

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Total for Question 1 = 6 marks

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Eve is a netballer and plays centre.

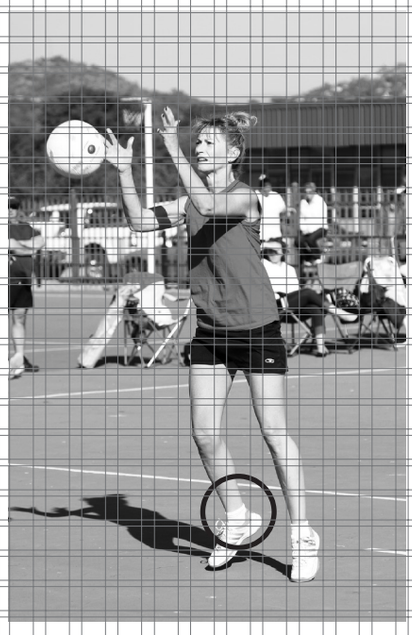


Figure 2

2 (a) Identify the movement occurring at Eve's ankle when she is jumping/taking off in **Figure 2**.

1 mark

(b) The ankle is an example of a synovial joint.

Explain the functions of ligaments within Eve's ankle.

2 marks

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(c) Explain the impact that participation in netball will have on Eve's chances of contracting arthritis.

3 marks

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.

Tristan is a football player, he plays in midfield. **Figure 3** shows the muscles of his lower leg.

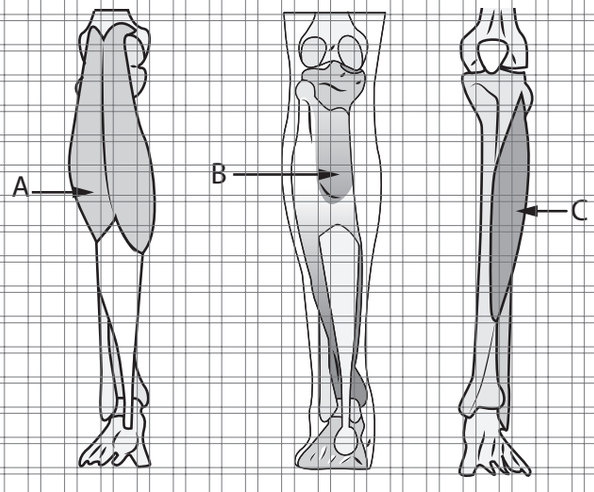


Figure 3

3 (a) Name the muscles labelled A–C in **Figure 3**.

3 marks

A .....

B .....

C .....

(b) Explain how type IIx muscle fibres would be beneficial for Tristan when playing football.

3 marks

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As part of Tristan's pre-season training he has undertaken lactate threshold training.

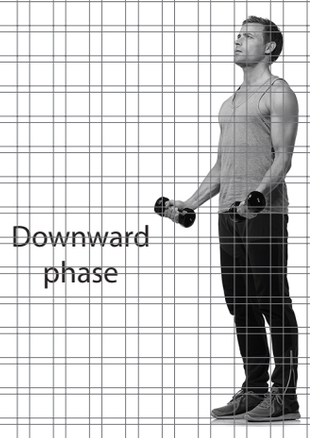
(c) Explain how increasing Tristan's tolerance to lactate would be beneficial to his football performance.

4 marks

Total for Question 3 =10 marks

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A fundamental part of Tristan's training is using weights to develop his upper body strength.



3 marks

Figure 4

4 Explain how the antagonistic muscle pairs at the elbow, as shown in **Figure 4**, allow Tristan to complete the downward phase of the bicep curl.

Total for Question 4 = 3 marks

TOTAL FOR SECTION B = 13 MARKS

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

Figure 5 shows the lungs.

5 Name the component parts of the lungs labelled A–C in **Figure 5**.

3 marks

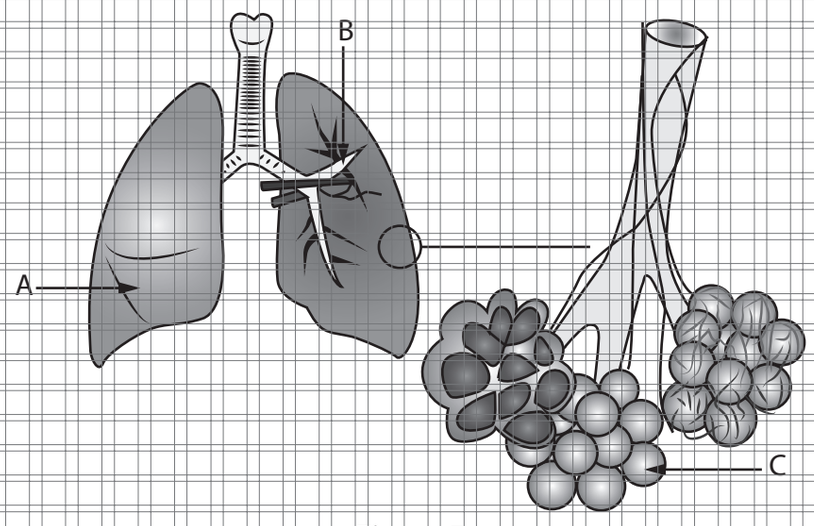


Figure 5

A .....

B .....

C .....

Total for Question 5 =3 marks

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Evan is a competitive triathlete and needs to prepare his body to meet the needs of the swimming, cycling and running sections of his event.

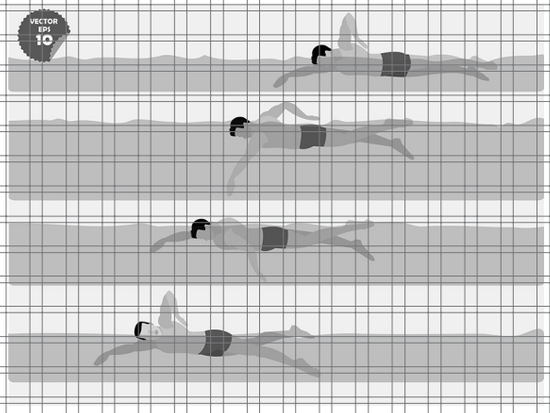


Figure 6

6 (a) Describe the mechanisms of breathing for inspiration during the swimming section of Evan's race compared with at rest.

4 marks

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The next section of the race is cycling.

(b) Explain how neural factors regulate Evan's respiratory system during the cycling section of his race.

4 marks

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The weakest part of Evan's triathlon is his running section. To improve this, Evan considers training at altitude to boost his performance for this section of the race.

(c) Analyse the **immediate** effects of altitude training on Evan's respiratory system.

6 marks

Total for Question 6 = 14 marks

TOTAL FOR SECTION C = 17 MARKS

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

A capillary is a blood vessel that enables gaseous exchange to occur.

7 Describe how the capillary aids the process of gaseous exchange.

3 marks

Total for Question 7 = 3 marks

8 Describe the functions of the right atria.

2 marks

Total for Question 8 = 2 marks

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9 Explain the role of the atrio-ventricular node (AVN) in the nervous control of the heart when exercising.

3 marks

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Table 1 shows Joe's stroke volume at rest and during his race following completion of his six week training programme.

	SV at rest (ml)	SV during the race (ml)
Before training programme	70	120
After training programme	85	140

Table 1

10 (a) Explain how an increased stroke volume would impact on Joe's performance.

4 marks

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Table 2 shows Joe's cardiac output at rest and during his race following completion of his six week training programme.

	Cardiac output (L/min) at rest	Cardiac output (L/min) during race
Before training programme	5	15
After training programme	5	19

Table 2

(b) Analyse, using **Table 2**, Joe's cardiac output values over the rest and race period and how this would affect his performance following completion of the six week training programme.

6 marks

Total for Question 10 = 10 marks
TOTAL FOR SECTION D = 18 MARKS

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SECTION E: Energy Systems for Sports Performance.
Answer ALL questions. Write your answers in the spaces provided.

Alyssa is a marathon runner and one of the adaptations to endurance training is that she has the ability to store more glycogen.

11 Explain **one** reason why increased glycogen storage would be beneficial to Alyssa's marathon performance.

2 marks

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Total for Question 11 = 2 marks

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12 Explain how Alyssa's body uses oxygen to recover after intense exercise.

4 marks

Total for Question 12 = 4 marks

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Jasmine is a county rugby player and she trains regularly to improve her performance. As well as her rugby sessions, she will do two 30-minute runs per week to develop her aerobic system.

13 Evaluate the importance of the aerobic system for Jasmine's rugby performance.

6 marks

Total for Question 13 = 6 marks

TOTAL FOR SECTION E = 12 MARKS

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SECTION F: Interrelationships between Body Systems for Sports Performance.
Answer ALL questions. Write your answer in the space provided.

Freya is a national level badminton player and regularly competes in high-level competitive events . Her weekly training schedule involves high intensity interval training and intense long distance running.

14 Analyse how the physiological adaptations to the muscular and energy systems, as a result of these intense training methods, can improve Freya's badminton performance.

8 marks

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Total for Question 14 = 8 marks

END OF EXAM

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