

Write your name here

Surname

Other names

Edexcel
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Centre Number

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Candidate Number

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Sport and Active Leisure

Level 3

**Unit 3: Science and Technology in Sport and
Active Leisure**

Tuesday 10 January 2012 – Afternoon

Time: 1 hour 30 minutes

Paper Reference

SL303/01

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 candidate 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 60.
- 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.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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PEARSON

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

1 Figure 1 shows an athlete sprinting 100m.

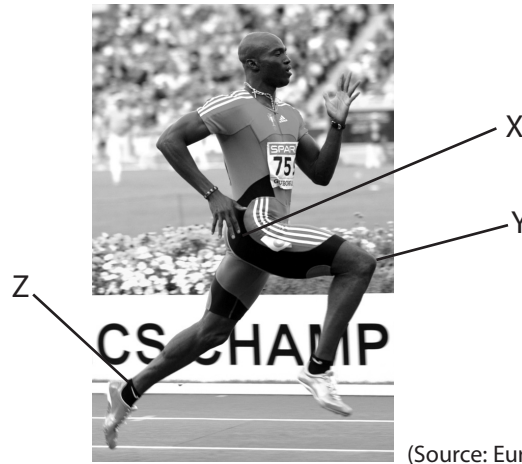


Figure 1

(Source: European Athletics Championships 2010)

(a) (i) Identify the types of synovial joints labelled as X, Y, and Z

(3)

X

Y

Z

(ii) Describe the movements that would be occurring at **two** of these joints.

Indicate which of the joints, labelled as X, Y or Z, you are describing.

(4)

Joint

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Joint

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Figure 2 shows the results of tests to assess the proportion of different types of skeletal muscle fibre present in three athletes' quadriceps.

Athlete	Type 1	Type 2a	Type 2b
A	50%	30%	20%
B	20%	40%	40%
C	30%	40%	30%

Figure 2

(b) (i) Using the results shown in Figure 2, state which athlete you would expect to win a 100m sprint.

(1)

(ii) Give reasons why you think this athlete would win the race.

(4)

(Total for Question 1 = 12 marks)



2 Figure 3 shows the changes in growth hormone levels when training at different intensities.

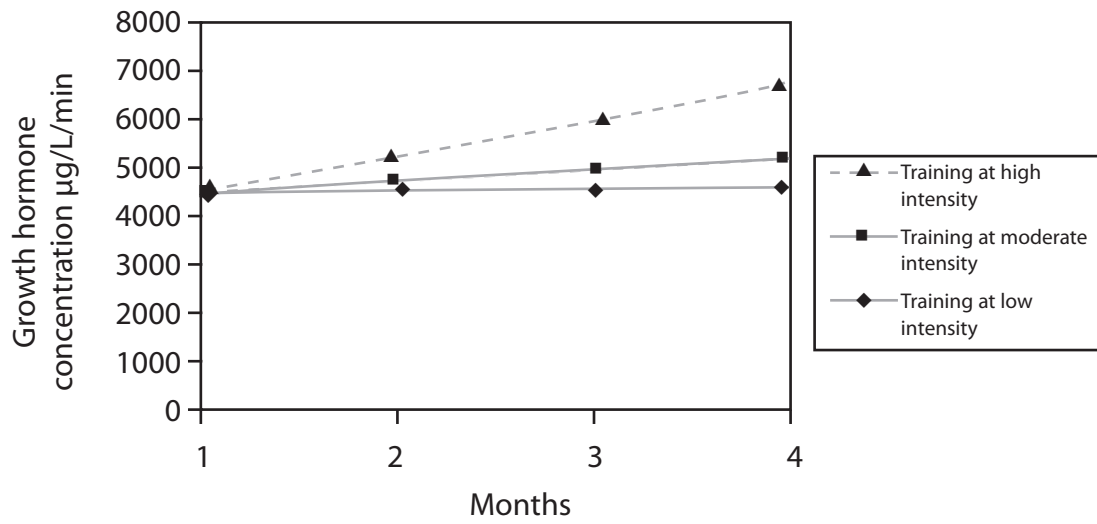


Figure 3

(a) State the relationship between exercise intensity and growth hormone production.

(1)



(b) Describe the physical effects of the body producing high levels of growth hormone.

(5)

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(Total for Question 2 = 6 marks)



3 Figure 4 shows a ball travelling through the air at low speed.

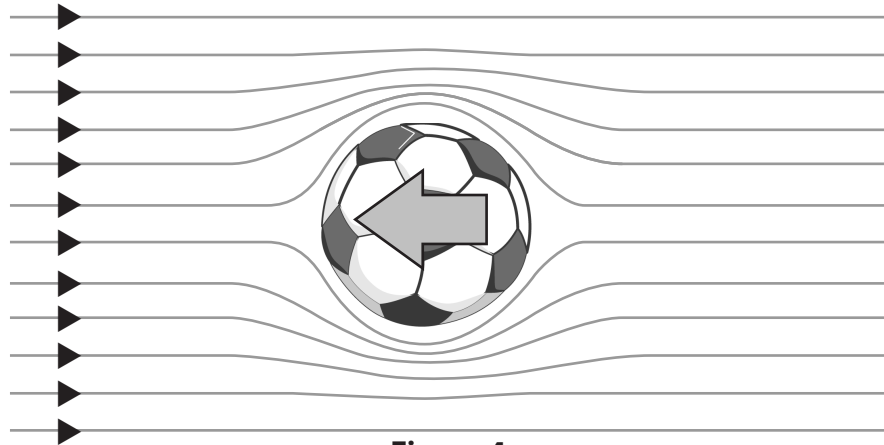


Figure 4

The lines in the diagram show the direction of air flow.

(a) Describe how the flow of air around the ball would be different if the ball was travelling at high speed. You may use a diagram to aid your description.

(2)

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(b) For a sport of your choice, outline why an understanding of drag is important.

(4)

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(Total for Question 3 = 6 marks)



4 Sarah is 18. She is of average fitness and is training for her first marathon. She has decided to use interval training in her preparations.

- During her interval training session Sarah sprints for 30 seconds and rests for 10 minutes. She repeats this 8 times.
- When sprinting, Sarah reaches 95% of her maximum heart rate.

(a) Explain why Sarah's interval training may not be effective preparation for her marathon.

(4)

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(b) Explain a method of training that would be appropriate for Sarah in preparation for her marathon.

(4)

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(d) Reena's coach has told her to be careful that she does not over-exercise.

Outline **two** possible effects of over-exercising.

(4)

1

2

(Total for Question 4 = 20 marks)



- 5 A manufacturer of sports equipment has developed a new pair of athletics spikes and has been testing how their use affects performance during sprinting. Testing involved comparing the performance of the new spikes with an older pair.

Testing information

All tests were conducted over 100m on an athletics track.

All athletes were 16 – 18 year old male club athletes.

In Test A athletes ran in the old spikes.

In Test B athletes ran in the new spikes.

Figure 6 shows the results of the testing.



Athlete	Test A (seconds)	Test B (seconds)	Date of testing
1	11.2	11.0	21/06/10
2	14.1	14.0	22/06/10
3	12.1	11.9	22/06/10
4	10.4	10.3	22/06/10
5	13.0	13.0	23/06/10

Figure 6

- (a) State what these results show about the effect of the new spikes.

(1)

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- (b) Explain how you could analyse these test results.

(5)

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(c) Evaluate the strengths and weaknesses of the testing.

(8)

Question 5 continues on the next page



(d) Outline **one** way in which technology can be used in the development of new products in sport and active leisure.

(2)

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(Total for Question 5 = 16 marks)

TOTAL FOR PAPER = 60 MARKS

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