

Please check the examination details below before entering your candidate information

Candidate surname					Other names				
Centre Number					Candidate Number				

Pearson Edexcel Level 3 GCE

Wednesday 24 May 2023

Afternoon (Time: 2 hours 30 minutes)

Paper reference **9PE0/01**

Physical Education

Advanced

COMPONENT 1: Scientific Principles of Physical Education

You must have:
Calculator and ruler

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 in Sections A and B.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 140.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- The question marked with an **asterisk (*)** requires candidates to use their knowledge and understanding from across the course of study in their answer.

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 – Applied anatomy and physiology**Answer ALL questions.****Write your answers in the spaces provided.****1** Define the following:

(i) Fixator

(1)

(ii) Synergist

(1)

(Total for Question 1 = 2 marks)**2** Name the main muscle responsible for each movement.

Movement	Muscle responsible
(i) Flexion of the trunk	(1)
(ii) Dorsi flexion of the ankle	(1)
(iii) Plantar flexion of the ankle	(1)

(Total for Question 2 = 3 marks)

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3 Summarise the structural characteristics of fast glycolytic (type IIx) muscle fibres.

(5)

(Total for Question 3 = 5 marks)

- 4 Summarise the chronic functional adaptations of the cardiovascular system to aerobic training.

(4)

(Total for Question 4 = 4 marks)

- 5 Using sporting examples, outline how the **five** forms of energy are transferred.

(5)

(Total for Question 5 = 5 marks)

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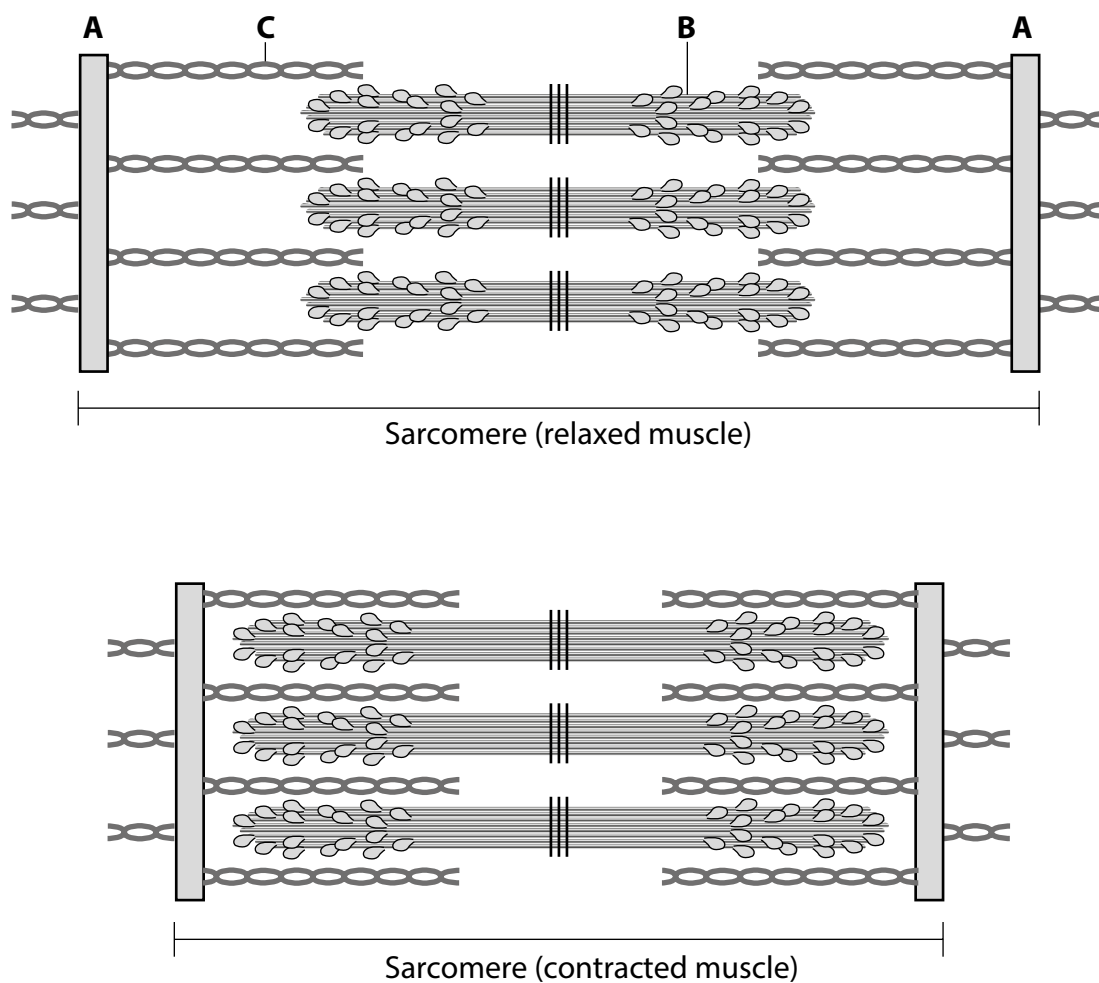
6 Describe vascular shunting.

(4)

(Total for Question 6 = 4 marks)



7 **Figure 1** shows a muscle sarcomere.



(Source: <https://www.shutterstock.com/image-vector/detail-muscle-sarcomere-showing-thin-thick-1288781587>)

Figure 1

(a) Name the parts in the diagram.

(i) A

(1)

(ii) B

(1)

(iii) C

(1)

(b) Summarise what happens within the sarcomere during a muscle contraction.

(5)

(Total for Question 7 = 8 marks)

8 Outline the ATP-PC system.

(4)

(Total for Question 8 = 4 marks)

9 Summarise the physiological processes occurring in the slow component of recovery.

(4)

(Total for Question 9 = 4 marks)

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10 Examine how the muscular and skeletal systems respond to a warm-up.

(8)

(Total for Question 10 = 8 marks)



- 11 Examine how the anatomical structures labelled in **Figure 2** cause the heart muscle to contract.

(8)

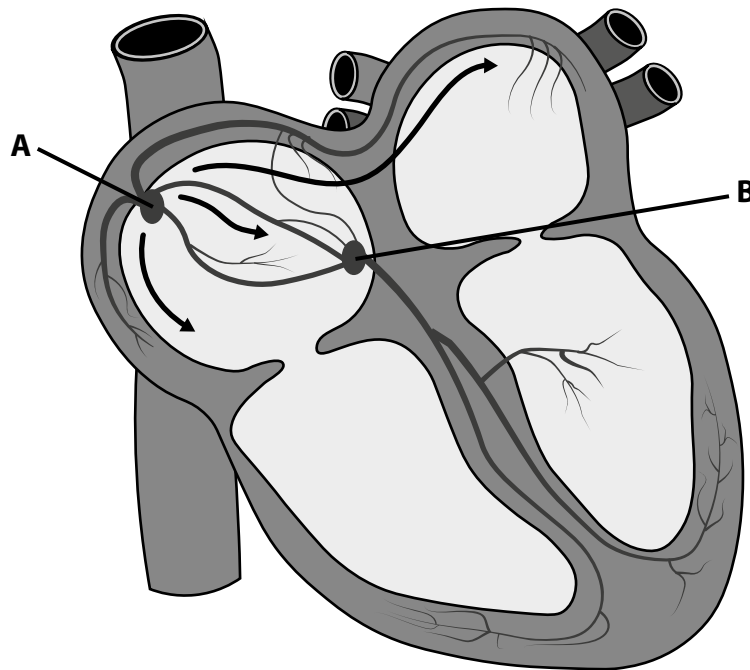


Figure 2

(Source: <https://www.shutterstock.com/image-vector/conduction-system-heart-showing-sa-av-228014488>)

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(Total for Question 11 = 8 marks)



12 Using examples, analyse how Newton's **three** Laws of Motion apply to sport.

(15)

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(Total for Question 12 = 15 marks)

TOTAL FOR SECTION A = 70 MARKS



SECTION B – Exercise physiology and applied movement analysis

Answer ALL questions.

Write your answers in the spaces provided.

13 Define the term power.

(1)

(Total for Question 13 = 1 mark)

14 Outline **three** different types of flexibility training.

(3)

(Total for Question 14 = 3 marks)



- 15** A 20 year-old male long jumper completes a series of fitness tests. The results are shown in **Table 1**.

Test	Result	Rating
Cooper 12 Minute Run	2350 metres	Average
Margaria Kalamen Test	1,563 watts	Average
20 m Acceleration Sprint	4.1 seconds	Above average
Yo Yo Intermittent Recovery Test	16.3	Average

Table 1

- (i) Using the results from **Table 1**, identify **one** score that he should aim to improve.

(1)

- (ii) Explain how an improvement in this test could improve his performance in the long jump.

(2)

(Total for Question 15 = 3 marks)

16 Describe the protocol for the Cunningham and Faulkner test.

(4)

(Total for Question 16 = 4 marks)

17 Outline **four** disadvantages of fitness testing.

(4)

(Total for Question 17 = 4 marks)

18 Summarise the effects of topspin on a tennis ball.

(5)

(Total for Question 18 = 5 marks)

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19 Data from a 400 m athletics race is shown in **Table 2**.

Distance (–metres)	Time taken (seconds)	Speed (ms^{-1})
100	12.1	8.3
200	22.7	8.8
300	37.8	
400	52.3	7.7

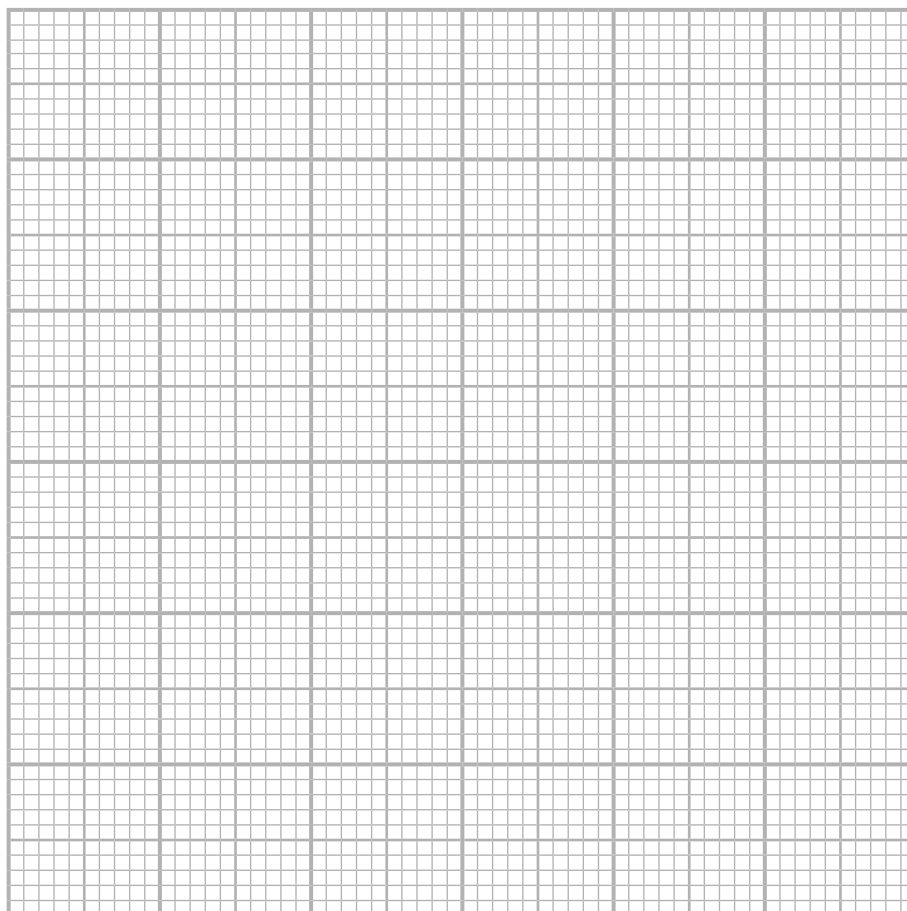
Table 2

(i) Calculate the athlete's average speed at 300 m.

(1)

(ii) Using the information in **Table 2** plot a speed-time graph for the 400 m race.

(3)



- (iii) Explain how the race strategy used by the athlete would have affected the use of the energy systems at each 100 m in the race.

(4)

- (iv) Explain how the athlete might have run the race more effectively using knowledge of energy systems.

(3)

(Total for Question 19 = 11 marks)

20 Examine the effects of different dietary supplements on power athletes.

(8)

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(Total for Question 20 = 8 marks)



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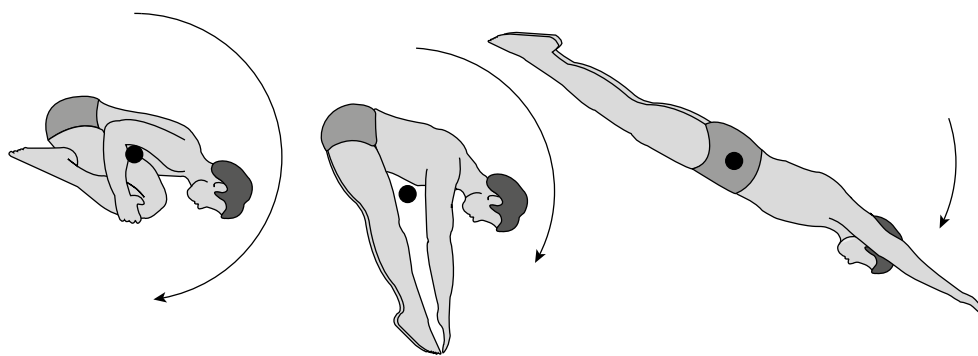
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21 Examine how an athlete could prepare for performance at altitude.

(8)

(Total for Question 21 = 8 marks)

- 22 Using examples of different body positions, examine how angular velocity would change during a dive from a 10 m platform as shown in **Figure 3**.



(Source: <https://qualifications.pearson.com/content/dam/pdf/A%20Level/Physical%20Education/2016/Teaching%20and%20learning%20materials/Topic-guide-3-Biomechanical-Movement-final.pdf>)

Figure 3

(8)

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(Total for Question 22 = 8 marks)

***23** Evaluate the most suitable fitness tests for a team game of your choice.

Use your knowledge and understanding from across the course of study to answer this question.

(15)

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(Total for Question 23 = 15 marks)

TOTAL FOR SECTION B = 70 MARKS
TOTAL FOR PAPER = 140 MARKS

