

Physical Education
Advanced
COMPONENT 1: Scientific Principles of
Physical Education

Total Marks

Time: 2 hours 30 minutes

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

YOU MUST HAVE

Calculator and ruler

YOU WILL BE GIVEN

Diagram Booklet

INSTRUCTIONS

Answer ALL questions.

Answer the questions in the spaces provided in this Question Paper or in the separate Diagram Booklet – 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.

(continued on the next page)

Turn over

INFORMATION continued.

The question marked with an **ASTERISK (*) requires candidates to use their knowledge and understanding from across the course of study in their answer.**

There may be spare copies of some diagrams.

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.

SECTION A – Applied anatomy and physiology

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

1 Define the following:

**(i) stroke volume
(1 mark)**

**(ii) cardiac output
(1 mark)**

(Total for Question 1 = 2 marks)

2 Explain how venous return affects stroke volume and cardiac output. (4 marks)

(continued on the next page)

Turn over

2 continued.

(Total for Question 2 = 4 marks)

- 3 Summarise why an endurance athlete might have bradycardia.
(4 marks)**

(continued on the next page)

Turn over

3 continued.

(Total for Question 3 = 4 marks)

**4 Identify THREE movements possible at the ankle joint.
(3 marks)**

(i)

(ii)

(iii)

(Total for Question 4 = 3 marks)

- 5 Summarise, using ONE sporting example for each, the following types of muscle contraction: concentric, eccentric and isometric.
(6 marks)**

(a) Concentric

Summary of the muscle contraction

(continued on the next page)

5 continued.

Sporting example

(continued on the next page)

5 continued.

(b) Eccentric

Summary of the muscle contraction

(continued on the next page)

5 continued.

Sporting example

(continued on the next page)

5 continued.

(c) Isometric

Summary of the muscle contraction

(continued on the next page)

Turn over

5 continued.

Sporting example

(Total for Question 5 = 6 marks)

- 6 Look at the diagram for Question 6 in the Diagram Booklet. Summarise the function of any FOUR of the labelled parts of a motor neurone.
(4 marks)**

(continued on the next page)

Turn over

6 continued.

(Total for Question 6 = 4 marks)

- 7 Outline FOUR possible healthy lifestyle changes to reduce the risk of cardiovascular diseases.
(4 marks)**

(continued on the next page)

Turn over

7 continued.

(Total for Question 7 = 4 marks)

- 8 Following the resting stage, describe the remaining FOUR stages of muscle contraction.
(4 marks)**

(continued on the next page)

Turn over

8 continued.

(Total for Question 8 = 4 marks)

- 9 Following a period of strength training, an athlete may have more powerful muscular contractions.**

**Examine the structural adaptations that would enable this to occur.
(8 marks)**

(continued on the next page)

Turn over

9 continued.

(continued on the next page)

9 continued.

(continued on the next page)

9 continued.

(Total for Question 9 = 8 marks)

**10 Examine the physiological processes occurring in the fast component of recovery.
(8 marks)**

(continued on the next page)

Turn over

10 continued.

(continued on the next page)

10 continued.

(continued on the next page)

10 continued.

(Total for Question 10 = 8 marks)

- 11 Examine the strategies a coach can use before, during and after a competition to enhance recovery processes.
(8 marks)**

(continued on the next page)

Turn over

11 continued.

(continued on the next page)

11 continued.

(continued on the next page)

11 continued.

(Total for Question 11 = 8 marks)

**12 Discuss how the cardiovascular and respiratory systems function both individually and in conjunction with each other.
(15 marks)**

(continued on the next page)

Turn over

12 continued.

(continued on the next page)

12 continued.

(continued on the next page)

12 continued.

(continued on the next page)

12 continued.

(continued on the next page)

12 continued.

(continued on the next page)

12 continued.

(continued on the next page)

12 continued.

(continued on the next page)

12 continued.

(continued on the next page)

12 continued.

(continued on the next page)

Turn over

12 continued.

(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 following:
(3 marks)**

(i) speed

(ii) velocity

(continued on the next page)

13 continued.

(iii) acceleration

(Total for Question 13 = 3 marks)

- 14 The table shows the split times for an 800 m race.**

Distance travelled (metres)	Time (seconds)
100	13
200	28
300	43
400	57
500	70
600	84
700	99
800	110

- (a) Look at the grid for Question 14(a) in the Diagram Booklet. Plot a graph of distance on the grid against time for this data set.
(3 marks)**

(continued on the next page)

Turn over

14 continued.

**(b) Using the graph you have drawn,
calculate the speed of the athlete at
600 m and 800 m.
(2 marks)**

Speed at 600 m

Speed at 800 m

(continued on the next page)

Turn over

14 continued.

**(c) Calculate the average acceleration
between 600 m and 800 m.
(3 marks)**

(continued on the next page)

Turn over

14 continued.

(Total for Question 14 = 8 marks)

**15 Outline FIVE strategies that can be used to prevent sporting injuries.
(5 marks)**

(continued on the next page)

Turn over

15 continued.

(Total for Question 15 = 5 marks)

**16 Outline the FIVE stages of POLICE in the rehabilitation of injuries.
(5 marks)**

(continued on the next page)

Turn over

16 continued.

(Total for Question 16 = 5 marks)

**17 Outline the protocol for the multi-stage fitness test.
(5 marks)**

(continued on the next page)

Turn over

17 continued.

(Total for Question 17 = 5 marks)

**18 (a) Define plyometric training.
(1 mark)**

(continued on the next page)

18 continued.

**(b) Summarise the advantages and disadvantages of plyometric training.
(6 marks)**

(continued on the next page)

Turn over

18 continued.

(continued on the next page)

18 continued.

(Total for Question 18 = 7 marks)

19 Using examples, summarise the TWO main classifications of common sporting injuries and their causes. (6 marks)

(a)

Classification of common sporting injuries

Cause

(continued on the next page)

Turn over

19 continued.

Example

(continued on the next page)

19 continued.

(b)

Classification of common sporting injuries

Cause

(continued on the next page)

19 continued.

Example

(Total for Question 19 = 6 marks)

**20 Examine different fitness tests used to measure aerobic power.
(8 marks)**

(continued on the next page)

Turn over

20 continued.

(continued on the next page)

20 continued.

(continued on the next page)

20 continued.

(Total for Question 20 = 8 marks)

**21 Using examples, examine how dietary supplements can be used to enhance sporting performance.
(8 marks)**

(continued on the next page)

Turn over

21 continued.

(continued on the next page)

Turn over

21 continued.

(continued on the next page)

Turn over

21 continued.

(Total for Question 21 = 8 marks)

***22 Analyse how an athlete can use periodisation to prepare for an Olympic or World Championship event.**

**Use your knowledge and understanding from across the course of study to answer this question.
(15 marks)**

(continued on the next page)

Turn over

22 continued.

(continued on the next page)

Turn over

22 continued.

(continued on the next page)

Turn over

22 continued.

(continued on the next page)

Turn over

22 continued.

(continued on the next page)

Turn over

22 continued.

(continued on the next page)

22 continued.

(continued on the next page)

22 continued.

(continued on the next page)

Turn over

22 continued.

(continued on the next page)

22 continued.

This image shows a blank sheet of white paper with ten horizontal black lines. The lines are evenly spaced and run across the width of the page, providing a template for writing or drawing.

(Total for Question 22 = 15 marks)

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