

General Certificate of Education
January 2003
Advanced Subsidiary Examination



SPORT AND PHYSICAL EDUCATION
Unit 4

PED4

Thursday 30 January 2003 Morning Session

<p>In addition to this paper you will require: a 12-page answer book.</p>
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Time allowed: 1 hour 30 minutes

Instructions

- Use blue or black ink or ball-point pen. Pencil should only be used for drawing.
- Write the information required on the front of your answer book. The *Examining Body* for this paper is AQA. The *Paper Reference* is PED4.
- Answer **four** from **five** questions.
- Do all rough work in the answer book. Cross through any work you do not want marked.

Information

- The maximum mark for this paper is 64.
- Mark allocations are shown in brackets.
- You will be assessed on your ability to use an appropriate form and style of writing, to organise relevant information clearly and coherently, and to use specialist vocabulary, where appropriate.
- The degree of legibility of your handwriting and the level of accuracy of your spelling, punctuation and grammar will also be taken into account.
- Up to 4 marks will be awarded for the quality of your written communication.

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Physiological, Biomechanical and Psychological Factors which Optimise Performance

Answer **four** from **five** questions.

1**Total for this question: 15 marks**

Sport often requires individuals to perform within groups or teams. Successful teams need time to develop.

- (a) Describe the stages of development that a basketball team may go through to enable the transition from a group of individuals to a cohesive team. (4 marks)
- (b) The coach of this basketball team believes that for his team to be successful, he needs to encourage cohesion. Discuss how valid this statement is in terms of both *task cohesion* and *social cohesion*. (4 marks)
- (c) In preparing to jump for a ball, a player lowers their body, before springing up. Explain how a player can change the height of a jump in terms of muscle fibre recruitment. (3 marks)
- (d) Sensory organs monitor the tension produced by muscle contraction when jumping. Explain how this is achieved and what happens to the sensory organs after a period of weight training. (4 marks)

2**Total for this question: 15 marks**

$\dot{V}O_2$ is a measure of oxygen uptake by the body per unit of time. Research has established that a high $\dot{V}O_2$ is beneficial to an elite long-distance swimmer.

- (a) Explain why the $\dot{V}O_2$ of women is typically 15%–30% below that of men. (4 marks)
- (b) An elite swimmer will plan a training programme over a period of time. Identify the phases of *periodisation* for improving cardio-respiratory endurance. (3 marks)
- (c) A swimmer is able to achieve qualifying times in training, but underperforms in competitions. Explain this discrepancy in terms of *social facilitation* theory. (4 marks)
- (d) What effect may competing in front of their own supporters and in a familiar pool have on the swimmer's performance? (4 marks)

Figure 1 shows an elite sprinter about to leave the starting blocks.

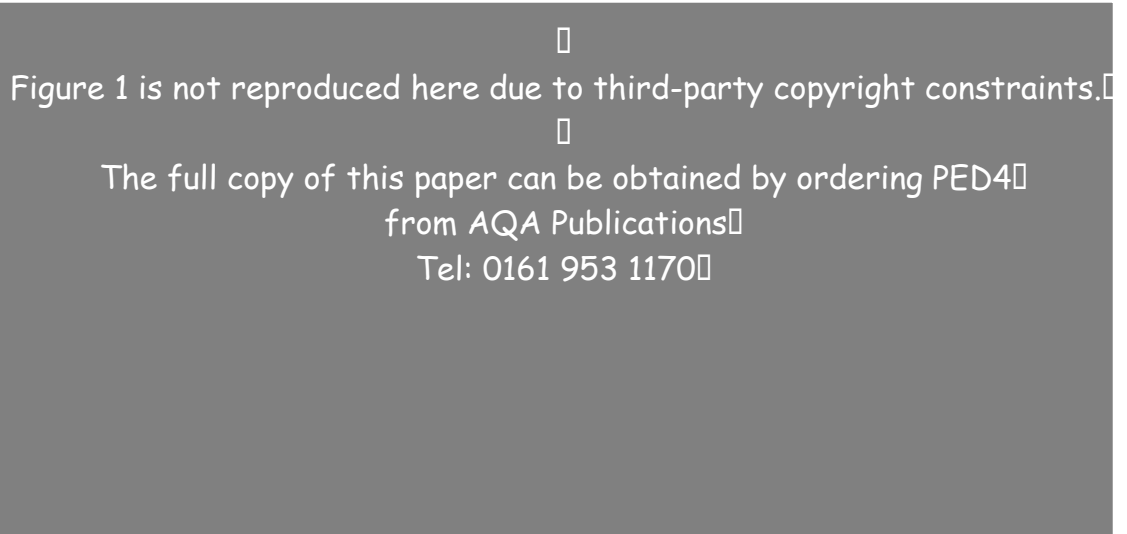


Figure 1

- (a) (i) Describe how Newton's three laws of motion can be applied when the sprinter drives from the blocks. (3 marks)
- (ii) Describe the forces acting upon a sprinter once they have left the blocks. (3 marks)
- (iii) Sprinters stop accelerating at 7–8 seconds into a 100 m race. In terms of energy systems, why does this occur? (2 marks)
- (b) Profile of mood states (POMS), as shown in **Figure 2**, are used to identify an individual's mental health before competition.



Figure 2

- (i) Comment on the profile of elite runners compared with the non-elite athletes, in terms of mood states. (3 marks)
- (ii) Discuss the validity of POMS tests for predicting success in sport. (4 marks)

Turn over ►

Figure 3 shows a gymnast completing a tucked back somersault.

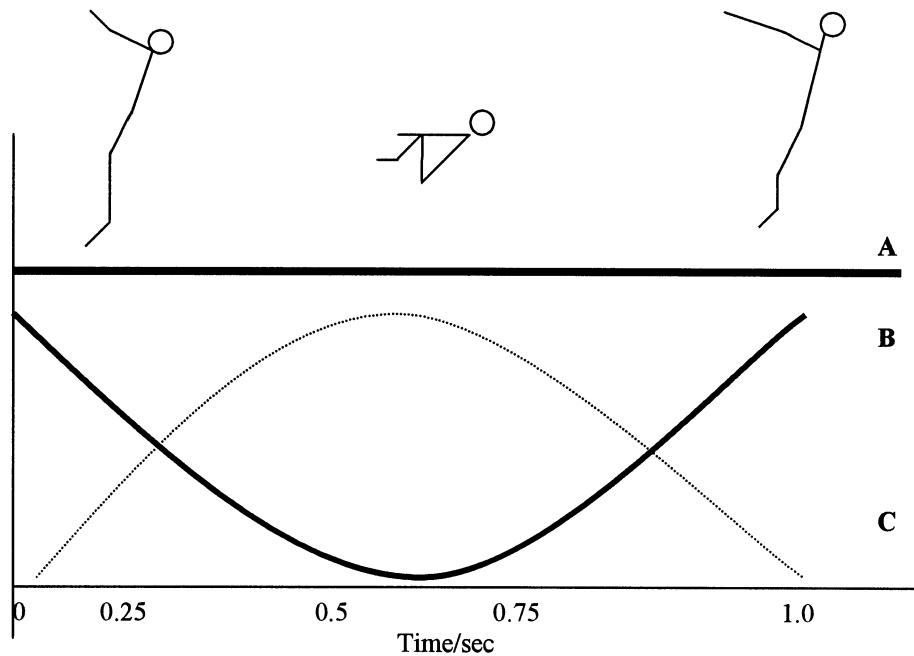


Figure 3

- Identify the **three** biomechanical parameters that are shown in **Figure 3** as **A**, **B** and **C**.
(3 marks)
- If a performer were to perform an “open” somersault, what would be the effect on **each** of the three parameters? Explain your answer.
(5 marks)
- How might the coach and the gymnast differ in their attributions following the unsuccessful performance of a somersault?
(2 marks)
- The gymnast may experience *learned helplessness*. What do you understand by this condition and how could a coach help the gymnast overcome it?
(5 marks)

Competitive team sports often take place in a highly charged atmosphere, which may affect a player's level of arousal and behaviour.

- (a) "Sport is often seen as a release valve for aggression." Discuss this statement using examples to illustrate your answer. (4 marks)
- (b) What methods can officials use to control aggression within a game? (3 marks)
- (c) Research has been conducted into "activity cycles" of intermittent sports such as soccer, hockey and rugby, which are reliant on efficient energy systems.

Identify the principal energy source for **each** of the following activity cycles in these types of physical activities:

- (i) walking;
- (ii) sprinting;
- (iii) jogging. (3 marks)
- (d) What are the **disadvantages** of using fat as an energy source during exercise? (2 marks)
- (e) Explain why glycogen utilisation would be lower in high intensity periods of play rather than in continuous type activities. (3 marks)

END OF QUESTIONS