General Certificate of Education
January 2003
Advanced Subsidiary Examination

ASSESSMENT and QUALIFICATIONS ALLIANCE

# SPORT AND PHYSICAL EDUCATION PED4
## Unit 4

Thursday 30 January 2003 Morning Session

**In addition to this paper you will require:**
a 12-page answer book.

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.

**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)*

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

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

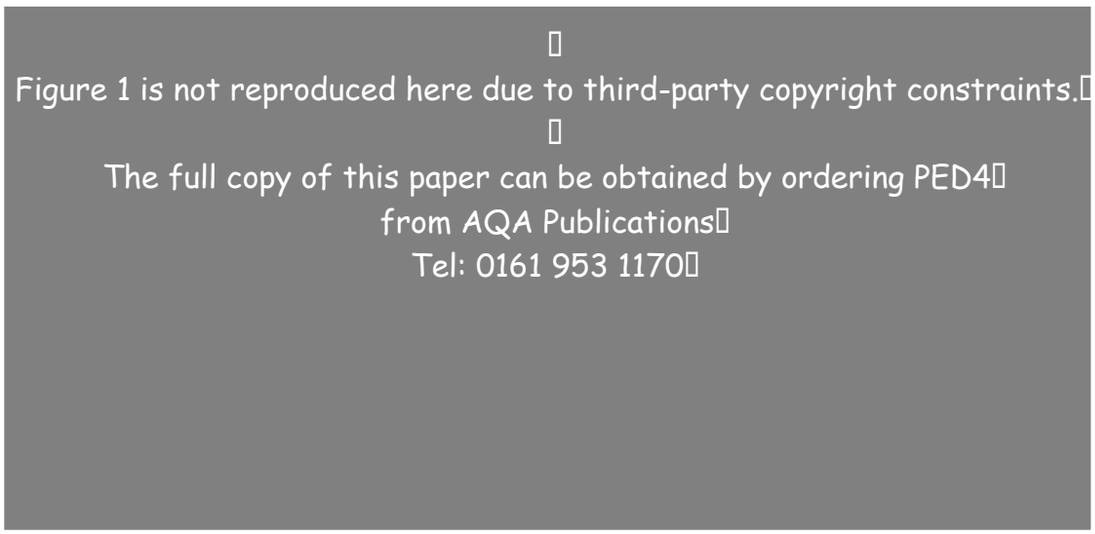


**Figure 1**

(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 ▶**

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

**Figure 3** shows a gymnast completing a tucked back somersault.

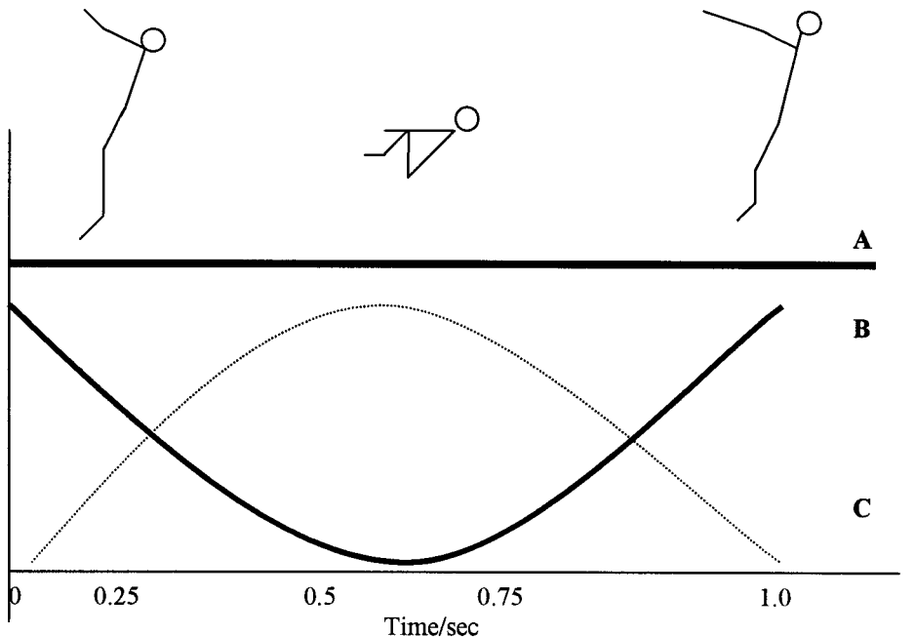


**Figure 3**

(a) Identify the **three** biomechanical parameters that are shown in **Figure 3** as **A**, **B** and **C**. *(3 marks)*

(b) 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)*

(c) How might the coach and the gymnast differ in their attributions following the unsuccessful performance of a somersault? *(2 marks)*

(d) 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)*

**5** **Total for this question: *15 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**