

General Certificate of Education  
January 2006  
Advanced Level Examination



**SPORT AND PHYSICAL EDUCATION**  
**Unit 4**

**PED4**

Tuesday 31 January 2006 9.00 am to 10.30 am

**For this paper you must have:**

- 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.
- 4 of these marks will be awarded for the Quality of Written Communication.
- The marks for questions are shown in brackets.

**Advice**

- 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.

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## Physiological, Biomechanical and Psychological Factors which Optimise Performance

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

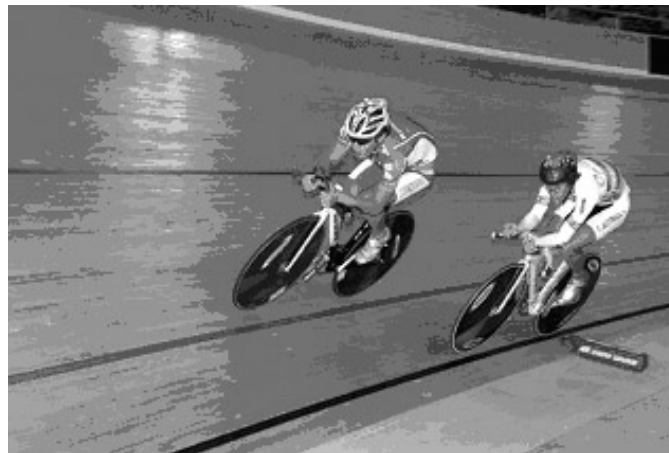
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1

**Total for this question: 15 marks**

**Figure 1** shows a sprint cycle race. This activity involves cycling four laps of a 250 metre track, with the final lap being completed as fast as possible. Elite performers cover the final lap in times of between 10 and 11 seconds.

**Figure 1**



Source: [www.cyclingnews.com](http://www.cyclingnews.com)

- Name the **main** energy system being used in the final sprint to the finishing line **and** explain how this system provides energy for the working muscles. (4 marks)
- At the end of the race, the cyclist will be out of breath and will continue to breathe heavily even though they have come to a complete rest. Explain why this breathlessness occurs. (4 marks)

Before important competitions, cyclists tend to become anxious.

- Name and explain the different forms of *anxiety* that a performer may experience. (4 marks)
- Various tests have been designed for measuring anxiety in sport. Name **one** of these tests, state how it is administered **and** what aspect of anxiety it measures. (3 marks)

2

**Total for this question: 15 marks**

Games players will use a variety of movements during their matches. The movements will involve muscular contractions of different muscle fibre types.

- (a) (i) Identify **five** structural **and/or** physiological differences between fast and slow-twitch muscle fibres. (5 marks)
- (ii) Suggest **three** possible physiological causes of muscle fatigue. (3 marks)

After a competitive match, players may explain their success or failure using a variety of factors called *attributions*. Weiner (1972) classified these attributions into four groups, and split the groups into two dimensions.

- (b) (i) What are the **two dimensions of attributions**? (2 marks)
- (ii) What are the **four groups of attributions**? (2 marks)

In terms of the attributions that games players make about their results, some attributions may be damaging to the players' future performances through the development of learned helplessness.

- (c) What do you understand by the term *learned helplessness* and what strategies may a coach use to prevent this from happening? (3 marks)

3

**Total for this question: 15 marks**

Elite performers are required to be well prepared both psychologically and physiologically. Psychological preparation is best served if the performer has high self-efficacy.

- (a) Explain what you understand by the term *self-efficacy*. (2 marks)
- (b) What strategies could a coach employ to improve the *self-efficacy* of a performer? (6 marks)

Elite performers may attend altitude training sessions in order to improve their performance.

- (c) (i) What are the supposed benefits of *altitude training*? (4 marks)
- (ii) Why is altitude training not always as effective as it should be? (3 marks)

**Turn over for the next question**

4

**Total for this question: 15 marks**

Elite performers often train by themselves, but may on occasions train as part of a group.

- (a) How would you distinguish a *group* from a collection of individuals? (4 marks)
- (b) Name **and** explain the stages that lead to group formation. (4 marks)

The training that elite performers undertake may include *plyometrics* and/or *proprioceptive neuromuscular facilitation (PNF)* stretching.

- (c) Explain the role of the *muscle spindle apparatus* in
- (i) plyometrics, (4 marks)
- (ii) PNF stretching. (3 marks)

5

**Total for this question: 15 marks**

Ice-skating competitions involve skating programmes that last approximately five minutes, and may involve spinning movements that conform to mechanical principles.

**Figure 2** shows an ice skater performing part of her routine.

**Figure 2**



Source: [www.trymysport.co.uk](http://www.trymysport.co.uk)

- (a) During a five-minute skating programme, what will be the **three** main energy sources used? (3 marks)

- (b) Using **Figure 2**, explain the mechanical principles that allow spinning ice-skaters to adjust their rate of spin. (6 marks)

An ice-skating squad may be regarded as a group and will often have a leader.

- (c) Describe how, according to Chelladurai's multidimensional model (1980), effective leadership leads to good performance outcomes and member satisfaction. (3 marks)

The way in which the members of a group inter-relate is called *cohesion*.

- (d) Discuss whether cohesive groups are always more successful. (3 marks)

**END OF QUESTIONS**

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Question 1 Source: [www.cyclingnews.com](http://www.cyclingnews.com)

Question 5 Source: [www.trymysport.co.uk](http://www.trymysport.co.uk)

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