

General Certificate of Education  
June 2006  
Advanced Level Examination



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

**PED4**

Friday 16 June 2006 1.30 pm to 3.00 pm

**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.
- The marks for part questions are shown in brackets.
- 4 of these marks will be awarded for the Quality of Written Communication.
- You are reminded of the need for good English and clear presentation in your answers. All questions should be answered in continuous prose. Quality of Written Communication will be assessed in all answers.

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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**

The triathlon is an athletic event that involves performers undertaking a long distance swim, immediately followed by a cycle race and then finally a run of several kilometres.

- (a) What would be the major *energy sources* used by a triathlete? (3 marks)
- (b) Briefly explain how these energy sources are used for *regeneration* of ATP. (5 marks)

It was previously thought that certain personality types tended to become involved in particular sports: therefore, those participating in a triathlon may have shared common personality characteristics.

- (c) In terms of personality, explain what is meant by *trait and interactionist* theories. (3 marks)
- (d) One aspect of personality is *achievement motivation*. What are the characteristics of an individual with a motive to achieve success? (4 marks)

2

**Total for this question: 15 marks**

Long-distance runners need a good psychological and physiological approach to their activity.

Most long-distance runners have positive attitudes to their preparation and performance.

- (a) (i) What is meant by the term *attitude* **and** how are attitudes formed? (4 marks)
- (ii) Discuss whether attitudes help predict behaviour. (3 marks)
- (b) Long-distance runners may prepare for their activity by *glycogen-loading*. What are its advantages and disadvantages to long-distance runners? (4 marks)
- (c) Long-distance runners may experience difficulties with their *temperature regulation* during performance. Why may an increase in body temperature cause a problem **and** how is it regulated during performance? (4 marks)

3

Total for this question: 15 marks

The fitness levels of the members of a sports team will vary. One measure of fitness is  $\dot{V}O_2$  max.

- (a) (i) What is meant by the term  $VO_2$  max? (2 marks)
- (ii) Suggest **five** structural and/or physiological causes of the difference in  $\dot{V}O_2$  max between a trained and an untrained performer. (5 marks)
- (b) The members of a sports team are usually led by a captain, manager or coach. Fielder (1967) suggested that such leaders had one of two types of leadership style.

Identify Fielder's **two** *leadership styles* and describe the situations in which each type of leader would be most effective. (4 marks)

- (c) 'In order to be effective, leaders need to be sensitive to the characteristics of the group members.'

Explain how leadership styles should be adapted depending on the different characteristics such as age, gender, size and skill levels of a team. (4 marks)

**Turn over for the next question**

Elite sport performers prepare psychologically for activities and use force to produce their required movement.

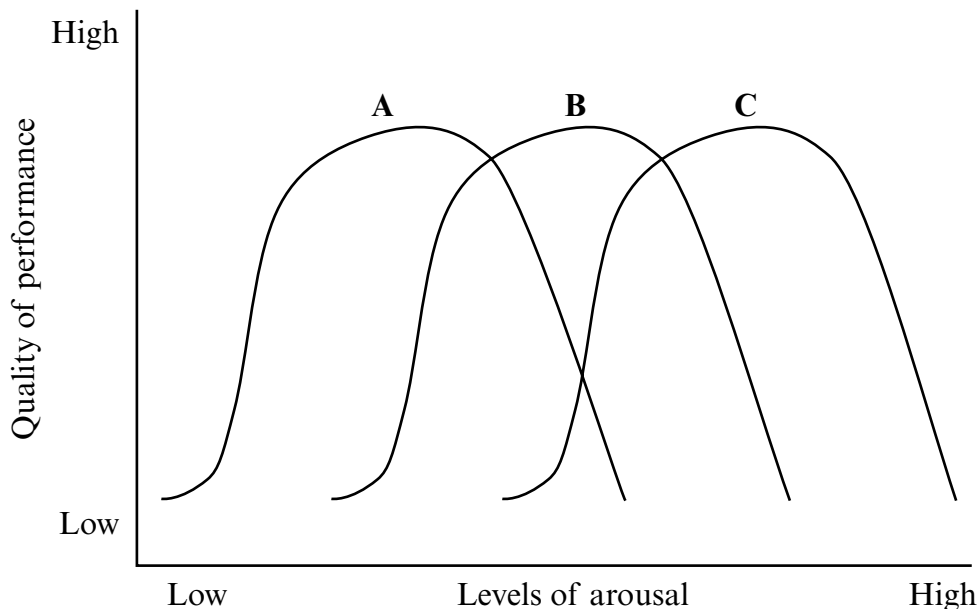
The inverted U theory may be used to explain how arousal may affect sports performance.

(a) (i) Name **two** other theories of *arousal*. (2 marks)

(ii) **Figure 1** shows the arousal–performance relationship for:

- passing in hockey
- putting in golf
- tackling in rugby.

**Figure 1**



Using **Figure 1**, match each of the curves **A**, **B** and **C** to one of these activities justifying your choice. (4 marks)

(iii) Explain how the **required** levels of arousal vary between a novice and an elite performer. (2 marks)

(b) Use *Newton's three laws of motion* to explain how a performer can move towards the ball in one of these games. (4 marks)

(c) In hockey, golf and rugby, the performer may hit or kick the ball into the air, where it becomes a *projectile*. Explain how the various forces involved act to affect a projectile **during** its flight. (3 marks)

Elite performers take part in training programmes that are carefully planned and will often include goal-setting to improve performance.

- (a) Why should *goal-setting* lead to improved performance? (3 marks)
- (b) Explain the main principles of effective goal-setting. (5 marks)
- (c) As part of their training programme, an elite 400 metre runner uses interval training. **Table 1** shows their time for six 400 metre sprints, where each sprint was followed by a 60 second recovery period.

**Table 1**

First run	Second run	Third run	Fourth run	Fifth run	Sixth run
52.6 seconds	52.8 seconds	53.2 seconds	53.4 seconds	53.6 seconds	54.2 seconds

During this training session, the athlete would have reached their *lactate threshold*.

What do you understand by the term lactate threshold **and** how would the majority of the athlete's energy be supplied during the periods of activity?

(4 marks)

- (d) Using the information in **Table 1**, suggest reasons why the time taken to complete the final run was much slower than the time taken to complete the first run.

(3 marks)

**END OF QUESTIONS**

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