

General Certificate of Education  
January 2004  
Advanced Subsidiary Examination



**SPORT AND PHYSICAL EDUCATION**  
**Unit 1**

**PED1**

Tuesday 20 January 2004 Afternoon Session

<p><b>In addition to this paper you will require:</b> 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 PED1.
- 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 75.
- Mark allocations 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.
- Up to 3 marks will be awarded for the quality of your written communication.

## Physiological and Psychological Factors which Improve Performance

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

1

**Total for this question: 18 marks**

Swimming is an activity affected by important physiological and learning processes.

When competing at maximum effort, a swimmer will experience changes in the way that blood is distributed around the body, as shown in **Figure 1**, compared to rest.

**Estimated blood flow change in cm<sup>3</sup> per minute**

Organ	At Rest	% of total Blood Flow	Maximum Effort	% of total Blood Flow
Skeletal muscles	1000	20	26 000	88
Coronary vessels	250	5	1 200	4
Skin	500	10	750	2.5
Kidneys	1000	20	300	1
Liver/gut	1250	25	375	1.25
Brain	750	15	750	2.5
Other	250	5	625	0.75
Whole body	5000	100	30 000	100

**Figure 1**

*Source: CLEGG, Exercise Physiology (Feltham Press, 1995).*

- (a) Explain why the blood flow to the brain remains the same during rest and during maximum effort. (2 marks)
- (b) Swimmers should not eat at least one hour before swimming. With reference to **Figure 1** explain why. (3 marks)
- (c) Explain how and why this redistribution of blood occurs during exercise. (4 marks)
- (d) Skills may be introduced by different methods of practice. Describe the front crawl in terms of its level of *complexity* and *organisation*. (2 marks)
- (e) Swimming may be taught using either the whole method or part method. What are the advantages of using:
  - (i) the whole method? (3 marks)
  - (ii) the part method? (4 marks)

2

**Total for this question: 18 marks**

Gymnastic activities rely on repetitive patterns that require high levels of fitness.

- (a) In schools, gymnastics can be taught as educational gymnastics which corresponds to a *problem-solving* teaching style. What are the advantages of this approach when teaching gymnastics? (3 marks)
- (b) On occasions, a teacher may need to adopt *command style* teaching. In what situations would this be necessary? (2 marks)
- (c) Explain **four** factors a teacher should consider when selecting an appropriate teaching style. (4 marks)
- (d) What do you understand by the term *body composition*? Explain why a gymnast's body fat needs to be low. (2 marks)
- (e) Flexibility and strength are important fitness components for a gymnast. Using examples, explain where each is used in gymnastics. (2 marks)
- (f) A coach may require their gymnasts to regularly undergo a series of generalised fitness tests. What purpose does such fitness testing serve and what are the limitations to such testing? (5 marks)

**TURN OVER FOR THE NEXT QUESTION**

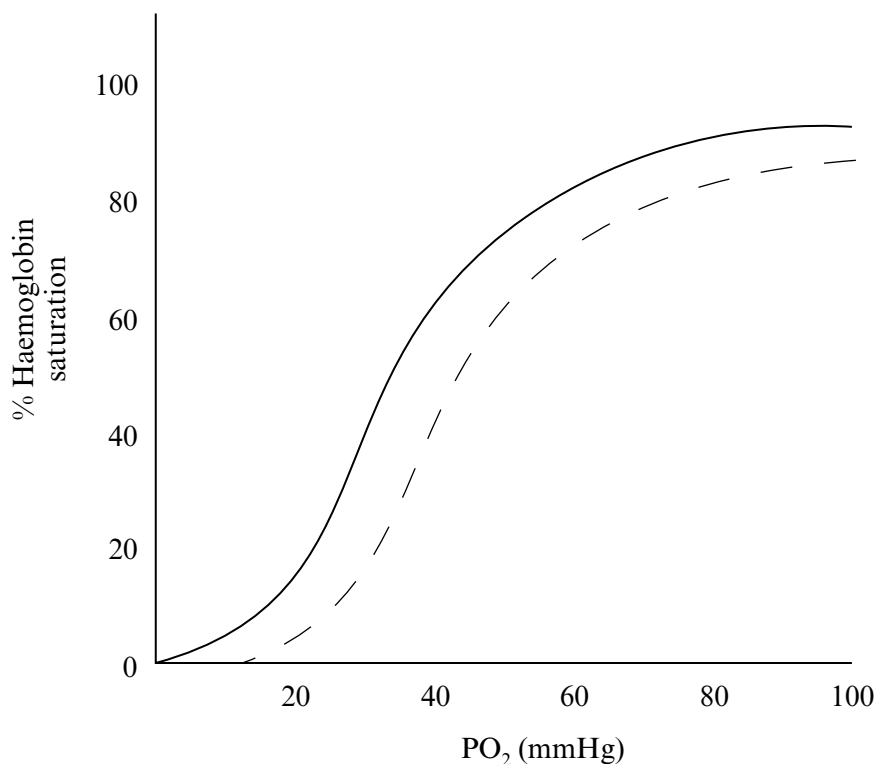
**Turn over ►**

3

Total for this question: 18 marks

Racket players require skills that they have previously learnt in order to perform movements. When performing they will require oxygen for muscle contraction.

- (a) In relation to skilled performance, what do you understand by the terms *motor programme* and *subroutines*? Give appropriate examples from a tennis serve. (3 marks)
- (b) *Schmidt's schema theory* is based on **four** sources of information which are used to modify motor programmes. List the **four** sources of information. (4 marks)
- (c) How can a coach organise practices to enable a schema to develop? (3 marks)
- (d) **Figure 2** shows the oxyhaemoglobin disassociation curve.



**Figure 2**

During exercise the curve shifts to the right. Explain the causes of this change and the effect that this has on oxygen delivery to the muscles. (4 marks)

- (e) Heart rate increases during exercise. Explain how the increasing levels of carbon dioxide in the blood raises the heart rate. (4 marks)

4

Total for this question: 18 marks

In cricket, players are involved in decision-making and running.



Source: [www.cricket.org/perl/picture.lg](http://www.cricket.org/perl/picture.lg): 1038146

**Figure 3**

- (a) The leg action in running has a drive phase and a recovery phase as show in **Figure 3**. Identify:
- (i) the plane and axis (2 marks)
  - (ii) the agonist, action and type of contraction in the drive phase (3 marks)
  - (iii) the agonist, action and type of contraction in the recovery phase (3 marks)
- (b) A batsman is waiting to receive the ball. As the bowler bowls, the batsman begins to move. With reference to the batsman, what do you understand by the terms *movement time*, *response time* and *reaction time*? (3 marks)
- (c) Give **four** factors that could affect the batsman's response time. (4 marks)
- (d) What strategies could the batsmen use to achieve a faster response time. (3 marks)

**TURN OVER FOR THE NEXT QUESTION**

**Turn over ►**

5

**Total for this question: 18 marks**

Volleyball players process information to enable them to use controlled and powerful movements. In volleyball, players have to use a squat type movement when playing the ball in a dig action as shown in **Figure 4**.



Source: [www.fairfield.edu/publications/ccot00/images/volleyball.jpg](http://www.fairfield.edu/publications/ccot00/images/volleyball.jpg)

**Figure 4**

- (a) State the joint action and the type of muscle contraction taking place at the knee and ankle during the downward phase of the dig. Name the major muscles used to bring about these actions. (6 marks)
- (b) Using an example from volleyball, what do you understand by the term *power*? Describe how it can be measured. (3 marks)
- (c) A basic information processing system consists of *perception*, *translation* and *effector control*. Explain what you understand by these terms, using appropriate examples from volleyball. (6 marks)
- (d) Selective attention is an important part of information processing. How can a coach improve a player's selective attention? (3 marks)

**END OF QUESTIONS**