

General Certificate of Education
January 2003
Advanced Subsidiary Examination



SPORT AND PHYSICAL EDUCATION
Unit 1

PED1

Tuesday 21 January 2003 Afternoon 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 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.
- 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.

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Physiological and Psychological Factors which Improve Performance

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

1

Total for this question: 18 marks

- (a) **Figure 1** shows phases of a tennis stroke.

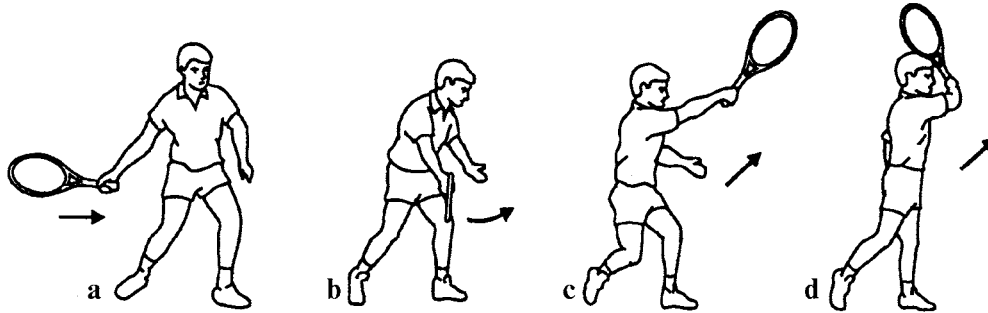


Figure 1

What joint actions are taking place at:

- (i) the **right shoulder** during the sequence **b – c**;
 - (ii) the **right elbow** during the sequence **c – d**? (2 marks)
- (b)
- (i) In the same sequence **c – d**, name the *agonist* causing the movements at the elbow joint, and name the type of muscle contraction involved. (2 marks)
 - (ii) In which **plane** and around what **axis** does this elbow movement take place? (2 marks)
 - (iii) **Name** and **sketch** a fully labelled diagram to show the lever system that operates at the elbow during this action. (3 marks)
- (c) Professional tennis players are able to serve the ball at very high speed. It takes 0.17 seconds for the ball to reach the receiver once it has left the server's racket.
- The time taken by the receiver to decide on an action is approximately 0.15 seconds.
 - The time taken for the receiver to play the return having decided on a stroke is 0.2 seconds.

Using the information provided, calculate the receiver's:

- (i) reaction time;
- (ii) response time;
- (iii) movement time. (3 marks)

- (d) Using your knowledge of information processing and decision making, explain what strategies the receiver could use to return the ball successfully in situations such as that described in part (c). (3 marks)
- (e) Suggest reasons why novice performers often find it difficult to return a serve successfully, even when it is delivered at a speed that they should be able to respond to. (3 marks)

2

Total for this question: 18 marks

- (a) Performers in the women's heptathlon compete in the 100 m sprint, high jump, long jump, shot putt, javelin, 800 m and 100 m hurdles. Name, giving a **reason** for your choice, **one** heptathlon event that is predominantly:
- (i) an open skill; (2 marks)
 - (ii) a continuous skill; (2 marks)
 - (iii) a serial skill; (2 marks)
 - (iv) a self-paced skill. (2 marks)
- (b) *Power* may be considered to be a major fitness component required by high jumpers.
- (i) What do you understand by the term *power*? (2 marks)
 - (ii) Name **two** other fitness components that you consider to be important for high jumping. (2 marks)
 - (iii) A timed 30 m sprint may be used as a test of power. Discuss whether such a test is *valid and reliable* for high jumpers. (4 marks)
 - (iv) Describe a test that you consider a better means of measuring the power component of a high jumper. (2 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over ►

3

Total for this question: 18 marks

During some games, performers need to make decisions about what to do with the ball.

- (a) **Figure 2** shows a simplified closed loop system of information processing.

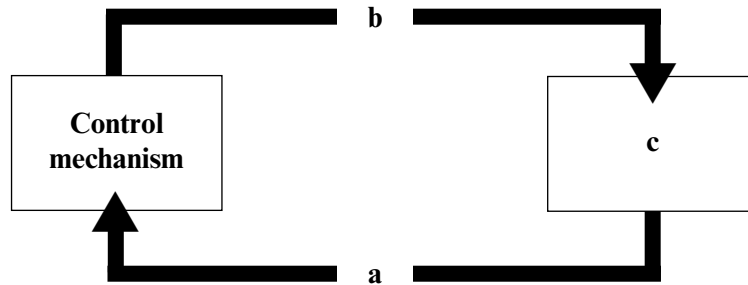


Figure 2

- (i) Identify those parts of the model as indicated at **a**, **b** and **c**. (3 marks)
- (ii) According to *Adam's closed loop theory*, **two** pieces of information are stored in long-term memory. What are these pieces of information, and how would they be used by a games player performing a technique in general play? (4 marks)
- (iii) Explain, using an example, why closed loop theory is not applicable to all skills. (3 marks)
- (b) The breathing characteristics of games players may alter during performance. **Figure 3** shows the proportion of oxygen and carbon dioxide breathed during exercise compared with rest.

	Inhaled air	Exhaled air at rest	Exhaled air during exercise
Percentage Oxygen	21.00	17.00	15.00
Percentage Carbon Dioxide	0.04	4.00	6.00

Figure 3

- (i) Use the information in **Figure 3** to describe the effects of exercise on *gas exchange* in the lungs. Suggest why these changes occur. (3 marks)
- (ii) In what form are carbon dioxide **and** oxygen transported by the blood? (2 marks)
- (iii) Explain the causes of the increase in breathing rate experienced during exercise. (3 marks)

4

Total for this question: 18 marks

When observing the performance of a gymnast, a coach may be trying to determine whether the performer is skilled or not.

- (a) What are the characteristics of skilled performance? (3 marks)
- (b) A coach may use *visual guidance* to improve performance.
- (i) What do you understand by the term *visual guidance*? Give **three** examples of how *visual guidance* may be used for a gymnast. (4 marks)
- (ii) How will the type of feedback being used by the gymnast vary as he/she becomes more skilled? (3 marks)
- (c) Gymnastic performance will demand an increase in blood supply to the active muscles. **Figure 4** shows how various measurements concerned with the heart vary during rest and activity.

	Rest	Activity
Heart rate (bpm)	70	150
Stroke volume (mls)	70	90
Systolic pressure (mm Hg)	115	140

Figure 4

- (i) What do you understand by the term *cardiac output*? Use the information in **Figure 4** to calculate the cardiac output at rest. (4 marks)
- (ii) What causes the increase in systolic pressure that occurs during exercise? (2 marks)
- (d) What effect would a period of several months training have on the exercising heart rate and stroke volume of this gymnast? (2 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over ►

5

Total for this question: 18 marks

Figure 5 shows a rugby player at the moment of impact when his foot connects with the ball during the skill of place kicking.



Figure 5

- (a) With reference to the *knee joint* of the **kicking** leg of the rugby player:
- (i) what are the names of the articulating bones; (2 marks)
 - (ii) what *joint action* is taking place at the knee at the moment leading up to impact, and what is the name of the *agonist* causing this action? (2 marks)
- (b) *Balance* and *flexibility* are two important fitness components required for the performance of this skill. Describe a suitable test for measuring **each** of these components. (4 marks)
- (c) Goal kicking is a skill where performance may easily be measured. In terms of testing skill performance, explain the difference between *subjectivity* and *objectivity* of skills testing. (2 marks)
- (d) Many people think that only certain personality types play rugby. What do you understand by trait theory as applied to personality? (4 marks)
- (e) What does Lewin's formula $B = f(P.E)$ suggest about the personalities of performers playing sports such as rugby? (4 marks)

END OF QUESTIONS