

General Certificate of Education  
June 2005  
Advanced Subsidiary Examination



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

**PED1**

Thursday 26 May 2005 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 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.
- You will be awarded up to 3 marks for the quality of your written communication.

## Physiological and Psychological Factors which Improve Performance

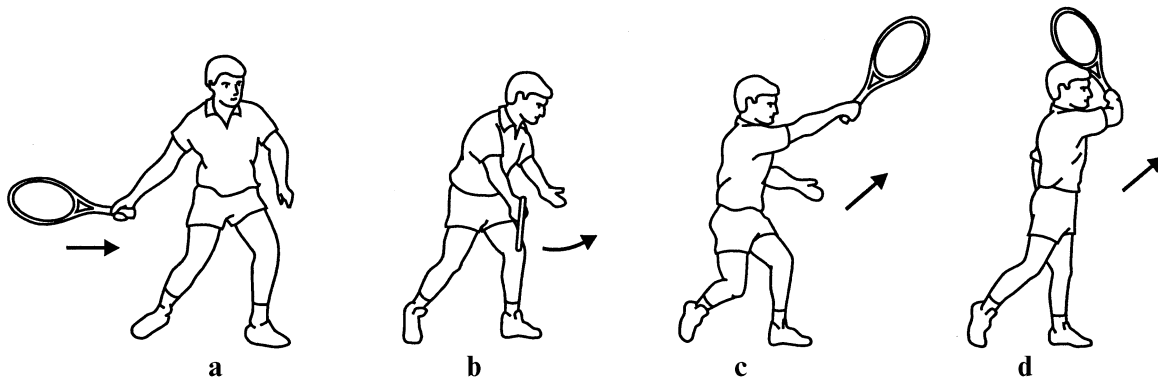
Answer **four** from **five** questions.

1

**Total for this question: 18 marks**

Effective analysis of movement and reaction to an opponent's shot can lead to an improvement in performance.

The tennis player in **Figure 1** is executing a forehand stroke.



**Figure 1**

- (a) (i) **In your answer book**, copy and complete **Table 1**, identifying the *type of joint*, the *joint action* and the *main agonist* of the shoulder from **a–c** and of the elbow from **c–d** used in the execution of the forehand stroke. (6 marks)

	Type of Joint	Joint Action	Main Agonist
<b>Shoulder</b>			
<b>Elbow</b>			

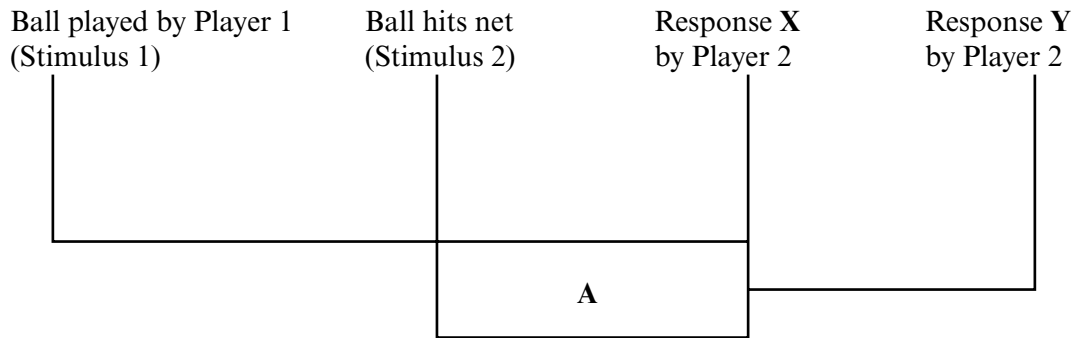
**Table 1**

- (ii) Name, sketch and label the lever system operating at the **elbow** during the action from **c–d**. (3 marks)

During rallies, tennis players have to react and respond quickly as a result of the action of their opponent.

- (b) (i) In terms of reacting quickly, explain the principles of Hick's Law. (2 marks)

**Figure 2** shows part of the processing that occurs as a result of an opponent's shot:



**Figure 2**

- (ii) Using **Figure 2**, identify the period represented by **area A** and give an example of response **X** and response **Y**. (3 marks)
- (iii) Using the *Single Channel Hypothesis*, explain why **area A** is created and why this may be a disadvantage for player 2. (4 marks)

**TURN OVER FOR THE NEXT QUESTION**

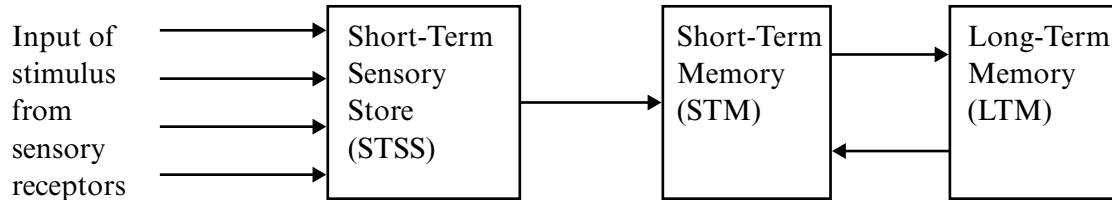
**Turn over ►**

2

**Total for this question: 18 marks**

For effective performance, sports performers require the ability to receive, interpret and pass on information.

**Figure 3** shows the relationships between the memory stores in a simple information-processing model.

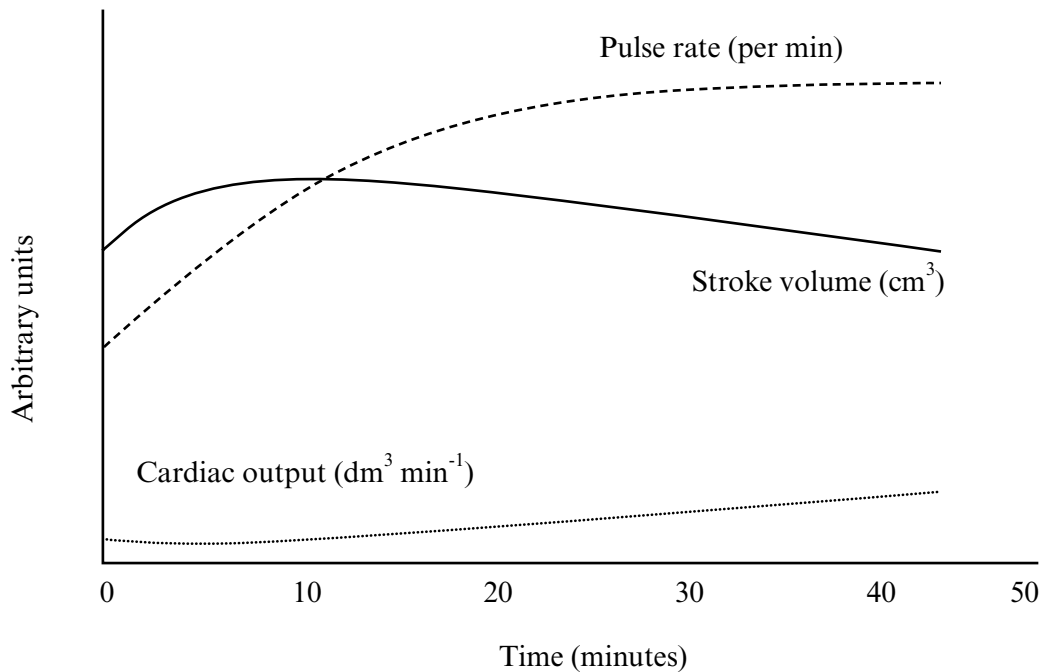


**Figure 3**

- (a) Using **Figure 3**, describe the main functions of the:
- (i) Short-Term Sensory Store; *(2 marks)*
  - (ii) Short-Term Memory; *(2 marks)*
  - (iii) Long-Term Memory. *(2 marks)*
- (b) Suggest how a coach might help the retention of newly learned skills by a sports performer. *(3 marks)*

**QUESTION 2 CONTINUES ON THE NEXT PAGE**

**Figure 4** shows the stroke volume, pulse rate and cardiac output of a performer completing a 30-minute run at sub-maximal pace on a treadmill.



**Figure 4**

- (c) (i) Briefly explain the terms *cardiac output* and *stroke volume* and the relationship between them. (3 marks)
- (ii) Using **Figure 4**, explain why the performer's cardiac output increases during a run of constant pace and workload. (4 marks)
- (iii) Explain how it is possible for a trained and an untrained individual to have the same cardiac output for a given workload. (2 marks)

**TURN OVER FOR THE NEXT QUESTION**

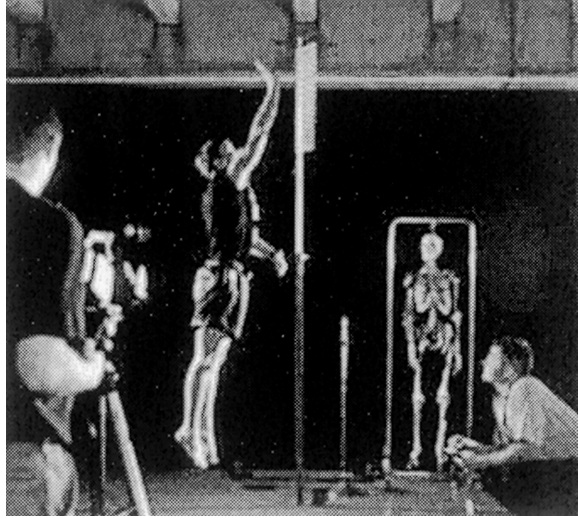
**Turn over ►**

3

Total for this question: 18 marks

Performance can be improved by conducting fitness tests and by taking part in appropriate training and practice sessions.

**Figure 5** shows a performer conducting a vertical jump test.



**Figure 5**

- (a) (i) The vertical jump test is a *reliable* and *valid* test for measuring leg power. What do you understand by the terms *reliability* and *validity*? (2 marks)
- (ii) Why is the vertical jump test more appropriate than a cycle power test for a high jumper? (2 marks)
- (b) **In your answer book**, copy and complete **Table 2**, identifying the *joint action* and the *main agonists* used in the upward phase of the vertical jump test. (5 marks)

Joint	Joint Action	Main Agonist
Hip		
Knee	Extension	
Ankle		

**Table 2**

**Figure 6** shows the performance curve of a beginner learning to shoot baskets in a massed practice session.

Figure 6 is not reproduced here due to third-party copyright constraints.

**Figure 6**

- (c) (i) Using **Figure 6**, identify phase **A** of the curve and give reasons for its occurrence.  
(5 marks)
- (ii) Describe **four** ways that a coach could overcome the problems created by phase **A**.  
(4 marks)

**TURN OVER FOR THE NEXT QUESTION**

**Turn over ►**

4

Total for this question: 18 marks

In order to produce skilled performances, hockey players combine and adapt their abilities to the demands of the game.

- (a) Explain the terms *Skill* and *Ability*. (3 marks)

Figure 7 shows a suggested skills profile of a hockey dribble within a game.

Continuous .....	*	.....	Discrete
Gross ...	*	.....	Fine
Self Paced .....	*	.....	Externally Paced
Closed .....	*	.....	Open
Intrinsic Feedback .....	*	.....	Extrinsic Feedback
Simple .....	*	.....	Complex

Figure 7

- (b) Justify the selection of each aspect of the profile. (6 marks)

The information in Table 3 was obtained from a performer at rest and during a game of hockey.

Organ system	Blood flow at rest $\text{cm}^3$	Percentage of total blood flow $\text{cm}^3$	Blood flow during the game $\text{cm}^3$	Percentage of total blood flow $\text{cm}^3$
Skeletal Muscle	1 200	21	12 500	72
Heart	250	4	750	4
Skin	500	8.5	1 900	11
Kidneys	1 100	19	600	3.5
Abdominal organs	1 400	24	600	3.5
Brain	750	13	750	4
Other	600	10.5	400	2
Total	5 800	100	17 500	100

Table 3

- (c) (i) Explain why the blood flow to the brain remains the same at rest and during the game. (2 marks)
- (ii) Explain why there is a need for blood flow to increase to the skeletal muscles during the game and how this is achieved. (4 marks)
- (iii) Blood supply is maintained by the venous return mechanisms. Explain how these mechanisms ensure the return of blood to the heart. (3 marks)



5

**Total for this question: 18 marks**

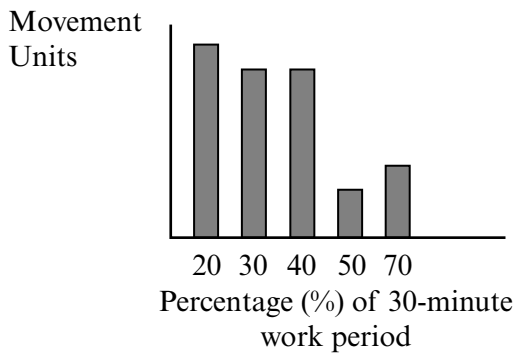
Performance is affected by practice conditions and the body's ability to meet the demands of exercise.

Two continuous tasks were used to investigate the effects of *massed practice* and *distributed practice* on learning. In Task 1, participants balanced on a balance board. In Task 2, participants climbed up and down a ladder.

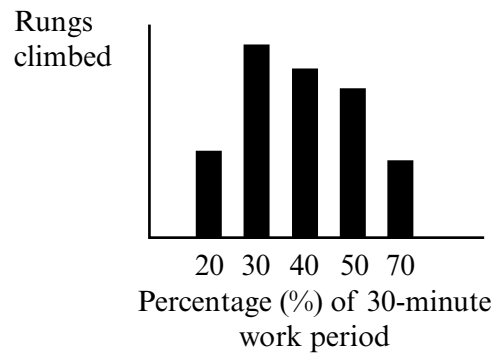
Participants completed their task five times, practising for 20%, 30%, 40%, 50% and 70% of a 30-minute work period.

**Figure 8** shows the scores achieved by the participants.

Task 1– Balance test  
(Low scores indicate good performance)



Task 2– Ladder test  
(High scores indicate good performance)



**Figure 8**

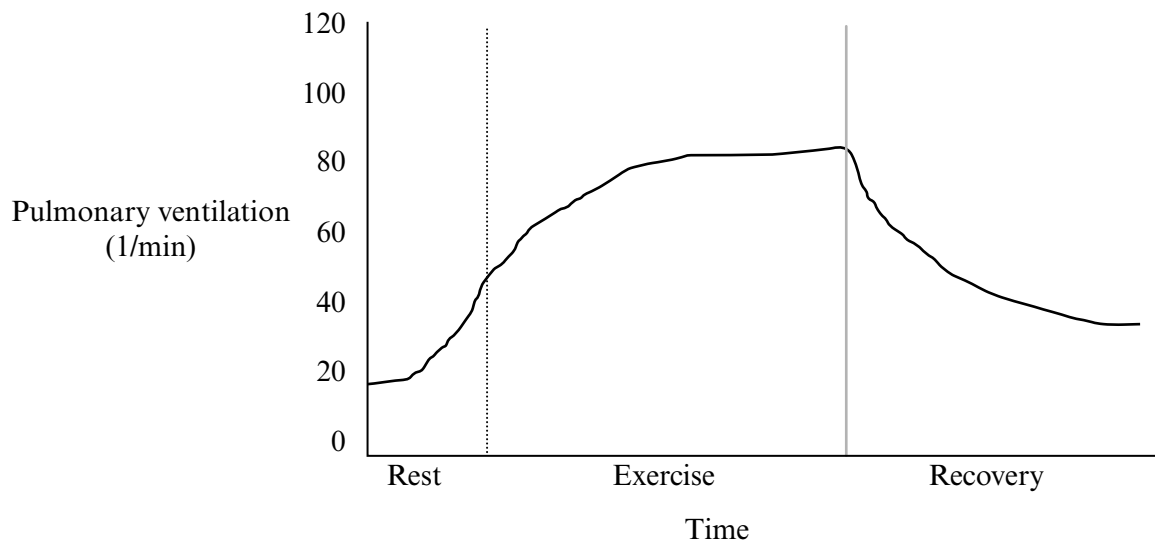
- (a) (i) Using the graphs in **Figure 8**, describe and explain the results of the experiment. (5 marks)
- (ii) Name **two** aspects of a task from any sporting situation and **two** characteristics of a learner that might lead you to decide whether to use *massed practice* or *distributed practice* to improve learning. (4 marks)

**QUESTION 5 CONTINUES ON THE NEXT PAGE**

**Turn over ►**

Ventilation rate varies with the duration and intensity of exercise.

**Figure 9** shows the ventilation rates of a performer working at a set intensity.



**Figure 9**

- (b) Explain the shape of the graph in **Figure 9**, with reference to the period:
- at rest;
  - during exercise. *(4 marks)*
- (c) Describe how the shape of the graph in **Figure 9** would alter for a performer:
- working at a lower intensity than that shown in **Figure 9**;
  - working at the same intensity as that shown in **Figure 9**, but after a period of several months' endurance training. Give reasons to support your answer. *(5 marks)*

**END OF QUESTIONS**

**THERE ARE NO QUESTIONS PRINTED ON THIS PAGE**

**THERE ARE NO QUESTIONS PRINTED ON THIS PAGE**

**ACKNOWLEDGEMENT OF COPYRIGHT HOLDERS AND PUBLISHERS**

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright holders have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements in future if notified.

Copyright © 2005 AQA and its licensors. All rights reserved.