

General Certificate of Education
June 2003
Advanced Subsidiary Examination



SPORT AND PHYSICAL EDUCATION
Unit 1

PED1

Thursday 22 May 2003 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.
- 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

A squash player spends several weeks during the summer playing tennis in the hope that it will improve her squash skills. When she returns to squash, she finds that some of her skill levels have deteriorated. Her coach suggests that transfer of learning may be the cause of her problem.

- (a) (i) Using examples from the situation described above, explain what is meant by the terms *positive*, *negative* and *bilateral transfer*. (6 marks)
- (ii) How could a coach ensure that positive transfer was likely to occur during the learning of a sports skill? (3 marks)
- (b) Squash is an indoor racket game involving considerable exertion, which often leaves the performer breathless.

Figure 1 shows the percentage of various gases found in inspired and expired air.

	Inspired (%)	Expired (%) At rest	Expired (%) During exercise
Oxygen	20	16	14
Carbon dioxide	0.04	4	6
Nitrogen	79	79	79
Water vapour	variable	saturated	saturated

Figure 1

Use the information in **Figure 1** to explain the *functions* of the lungs at rest **and** during exercise. (3 marks)

- (c) (i) Which lung volumes are used to provide expired air during exercise? (3 marks)
- (ii) Describe those characteristics of the structure of lungs that make them an efficient respiratory surface. (3 marks)

2

Total for this question: 18 marks

- (a) During exercise, the flow of blood to different parts of the body will alter as shown in **Figure 2**.

Part of the body	Rate of blood flow ($\text{cm}^3 \text{ min}^{-1}$)	
	At rest	During exercise
Muscle	1000	16000
Heart muscle	300	1200
Gut and liver	3000	1400
Brain	750	750
All other organs (except lungs)	1550	1550

Figure 2

- (i) Use the figures in **Figure 2** to calculate the *cardiac output* at rest. (2 marks)
- (ii) State **two** reasons for increased cardiac output during a period of exercise. (2 marks)
- (b) Describe how the *sinoatrial node* (SAN) and the *atrioventricular node* (AVN) control the increase in heart rate during exercise. (6 marks)
- (c) When instructing their performers, coaches often try to ensure that practice conditions are as varied as possible, since *variability of practice* is supported by Schmidt's Schema Theory.
- (i) What are the main principles of *Schmidt's Schema Theory*? (6 marks)
- (ii) What implications does *Schmidt's Schema Theory* have for the way in which sports skills should be taught? (2 marks)

3

Total for this question: 18 marks

During a team game such as volleyball, performers will use their senses to detect stimuli. **Figure 3** shows an information processing model.

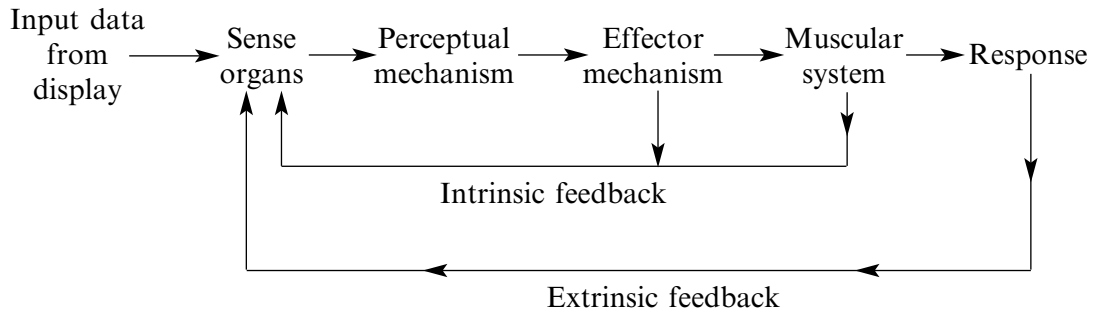


Figure 3

The model suggests that sense organs receive information from the display.

- State **three** of the major senses used in volleyball. (3 marks)
- Briefly explain the **three** processes that occur as part of the perceptual mechanism. (3 marks)
- What is the role of *short-term memory* in information processing? (3 marks)
- Blocking is a volleyball skill that requires the players to jump high to block attacking shots. The preparation for this jump involves a *downward* phase as shown in **Figure 4**.



Source: K. Nicholls, *Volleyball*, Crowood Press, 1986

Figure 4

Copy and complete **Figure 5** to show the type of joint and joint action involved, the main agonist and the type of contraction that occurs during this *downward* phase.

	Type of joint	Joint action	Agonist	Type of contraction
Hip		flexion		
Knee				eccentric
Ankle	hinge			

Figure 5

(9 marks)

TURN OVER FOR THE NEXT QUESTION

4

Total for this question: 18 marks

Training will improve both the level of fitness and the level of skill of a games player. The improvements in fitness that result from training are often measurable.

- (a) Cardio-respiratory endurance (stamina) is considered to be an important component of the fitness of games players.
- (i) What do you understand by the term *cardio-respiratory endurance*, and why should it be considered an important component of the fitness of games players? (2 marks)
 - (ii) Describe a suitable test for measuring cardio-respiratory endurance. (4 marks)
- (b) Cardio-respiratory endurance training will cause changes to the structure and functioning of the body that helps to improve performance. Describe these changes in terms of:
- (i) the heart;
 - (ii) the lungs. (4 marks)
- (c) **Figure 6** shows **two** ways of classifying the kinds of feedback available to the performer.

	Intrinsic	Extrinsic
Internal	A	B
External	C	D

Figure 6

Give examples, **where possible**, of the different kinds of feedback indicated by the labels **A**, **B**, **C** and **D**.

(4 marks)

- (d) As skill improves, the performer passes from the *cognitive* stage of learning, through the *associative* stage to the *autonomous* stage. In terms of game skills, describe how the main type of feedback used in the cognitive stage of learning differs from that used in the autonomous stage. (4 marks)

5

Total for this question: 18 marks

- (a) A basketball player is learning to shoot at the basket from the free throw line. **Figure 7** shows the movements involved.

Figure 7 is not reproduced here due to third-party copyright constraints.

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Figure 7

- (i) Name the main agonist working at the right elbow during the movement and describe the type of muscle contraction and the joint action taking place. (3 marks)
- (ii) Name, sketch and label the lever system operating at the elbow during performance of the skill. (3 marks)
- (b) In order to measure performance, the player takes 10 free throw shots and sees how many result in baskets. Discuss whether this would be a *valid* measure of the player's ability to play a game of basketball. (3 marks)
- (c) *Operant* theories of conditioning (learning) are based on the use of *reinforcement*.
- (i) Briefly explain the terms *positive reinforcement*, *negative reinforcement* and *punishment*, giving examples from a game such as basketball. (6 marks)
- (ii) Describe *Operant Conditioning Theory* and give an example of how you would use *operant* learning methods in the coaching of a game such as basketball. (3 marks)

END OF QUESTIONS