General Certificate of Education
June 2007
Advanced Level Examination

ASSESSMENT and QUALIFICATIONS ALLIANCE

SPORT AND PHYSICAL EDUCATION **PED4**
Unit 4

Friday 15 June 2007 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 to be marked.

Information
- The maximum mark for this paper is 64.
- The marks for questions are shown in brackets.
- Four of these marks will be awarded for using good English, organising information clearly and using specialist vocabulary where appropriate.

Physiological, Biomechanical and Psychological Factors which Optimise Performance

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

1 **Total for this question: 15 marks**

Figure 1 shows a tennis player moving towards the ball.

Figure 1 has been omitted due to third-party copyright restraints.

(a) Use *Newton's Three Laws of Motion* to explain how a tennis player moves towards the ball in preparation to play a stroke. *(5 marks)*

(b) Explain, in terms of the player moving towards the ball, the difference between *velocity* **and** *acceleration*. *(3 marks)*

(c) (i) Tennis matches are often played in front of an audience.

Using **appropriate theories**, explain how the effects of playing in front of an audience may differ for:

- An elite performer;
- A novice. *(5 marks)*

(ii) How could a coach prepare a **novice** tennis player who is about to play in front of spectators for the first time? *(2 marks)*

2 **Total for this question: 15 marks**

Rugby Union is a team game and most successful teams have effective leaders. It has been said that 'effective leadership is a dynamic interactional process'.

(a) What do you understand by the term *dynamic interactional process*? *(4 marks)*

Team games such as Rugby Union may involve physical contact which can lead to aggressive behaviour.

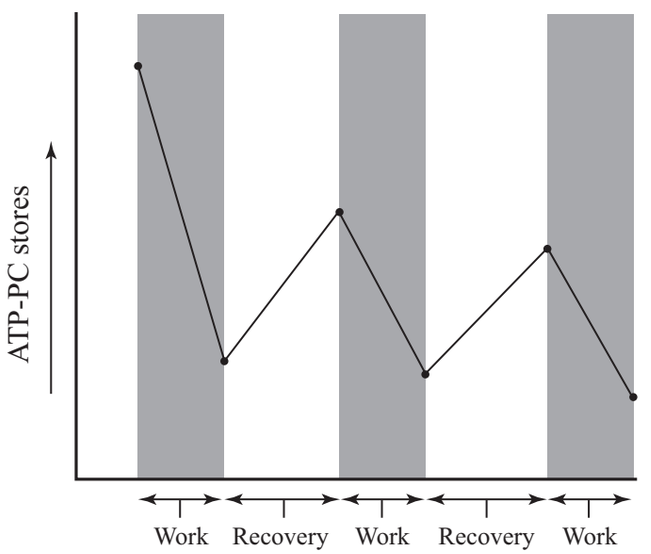
(b) (i) Use the *frustration–aggression theory* to explain why this may happen. *(2 marks)*

(ii) Explain why incidents of aggression occur only occasionally in team games such as rugby. *(2 marks)*

One popular form of training for Rugby Union is intermittent or interval training. This involves periods of intense exercise broken up with periods of rest.

Figure 2 shows levels of ATP-PC stores during a period of interval training. The player sprints 50 metres and then walks back to the start of the sprint to recover before repeating the sprint.

Figure 2



(c) (i) Use **Figure 2** to describe **and** explain the effects of interval training on ATP-PC levels. *(4 marks)*

(ii) Explain how ATP-PC levels are replenished during recovery. *(3 marks)*

3 **Total for this question: 15 marks**

The London Marathon participants include both elite athletes and fun runners.

Figure 3 shows the start of the London Marathon.

Figure **3** has been omitted due to third-party copyright restraints.

(a) Morgan's (1987) 'Profile of Mood States' questionnaire measures the emotional state of performers.

How would you expect the profiles to differ between elite performers and fun runners? *(3 marks)*

(b) The cognitive and somatic state anxiety of the competitors may vary as the start of the race approaches.

(i) What do you understand by the terms *cognitive state anxiety* **and** *somatic state anxiety*? *(2 marks)*

(ii) Describe how cognitive state anxiety and somatic state anxiety may vary prior to **and** during the race. *(3 marks)*

(c) The London Marathon is run over 42.2 km. Therefore, performance is largely dependent on the athlete's $\dot{V}O_2$ max.

(i) What do you understand by the term $\dot{V}O_2$ *max*? *(2 marks)*

(ii) List **five** *structural* **and/or** *physiological* reasons why the $\dot{V}O_2$ max of an elite athlete may be greater than that of a fun runner. *(5 marks)*

4 **Total for this question: 15 marks**

Figure 4 shows a netball player about to catch a ball. Once thrown, the ball follows a parabolic flight path.

Figure **4** has been omitted due to third-party copyright restraints.

(a) Name the forces acting on the ball while it is in the air **and** explain how these forces affect the ball's flight path. *(4 marks)*

(b) The player in **Figure 4** is preparing to catch the ball. Explain the role of *muscle spindles* in the action of catching the ball. *(3 marks)*

(c) Netball is a team game. Teams are thought to achieve more success if they are cohesive.

What do you understand by the term *cohesion* **and** explain the different types of cohesion. *(3 marks)*

(d) Social loafing can occur within sports teams. What do you understand by the term *social loafing* **and** what factors may cause it? *(5 marks)*

Turn over for the next question

5 **Total for this question: 15 marks**

Elite swimmers can complete a 200 metres free-style race in just under 2 minutes.

(a) (i) Describe how the **majority** of energy will be produced for this type of race. *(4 marks)*

(ii) Explain the main cause of *muscle fatigue* during this type of race. *(2 marks)*

(iii) Describe how the main cause of this muscle fatigue is removed from the body after the race. *(4 marks)*

(b) When preparing for a swimming event such as the 200 metres free-style, elite performers will set themselves goals. Explain the main principles behind *goal-setting*. *(5 marks)*

END OF QUESTIONS

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