

**ADVANCED GCE**  
**PHYSICAL EDUCATION**

**2566**

Exercise and Sport Physiology and the Integration of Knowledge of Principles and Concepts Across Different Areas of Physical Education

**WEDNESDAY 30 JANUARY 2008**

Morning

Time: 1 hour 30 minutes

**Additional materials (enclosed):** Answer Booklet (8 page)

**Additional materials (required):**  
None



**INSTRUCTIONS TO CANDIDATES**

- Write your name in capital letters, your Centre Number and Candidate Number in the spaces provided on the Answer Booklet.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- There are two sections in this paper.
- Answer the compulsory question in Section A and **one** question from Section B.

**INFORMATION FOR CANDIDATES**

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- You are advised to spend no longer than 30 minutes on Section A.
- There is a total of 45 marks available in Section B
  - 26 marks will be available for knowledge content. 19 marks are available for your ability to critically analyse and link your knowledge across different areas of PE, making connections between them and practical performance. The quality of written communication will also be taken into account.
  - Your answer should be in continuous prose and you are advised to link the two parts of the question you have chosen.
  - You are advised to spend no longer than one hour on Section B.

This document consists of **8** printed pages.

### Section A

Answer the question in this section.

You are advised to spend no longer than 30 minutes on this section.

#### Exercise and Sport Physiology

- 1 (a) Knowledge of the three energy systems underpins exercise and sport physiology.
- (i) Name an energy system and identify the missing information **A**, **B** and **C** for this system. [3]

Fuel used	<b>A</b>
Site of reaction	<b>B</b>
Controlling enzyme	<b>C</b>

- (ii) Sketch a graph of energy supplied against time to show when each of the three energy systems is predominant in relation to duration of exercise. [3]
- (b) Ergogenic aids are substances that enhance performance. Some examples are given in Table 1.

	Nutritional ergogenic aid	Physiological ergogenic aid
<b>Aerobic Athlete</b>	<b>D</b>	Erythropoietin (EPO)
<b>Anaerobic Athlete</b>	Fluid intake	Anabolic Steroids

**Table 1**

Describe a method of performance enhancement that could be placed in box **D**. Identify advantages of using this method. [4]

- (c) Table 2 identifies physiological adaptations that have taken place after a period of aerobic training.

	<b>Before training</b>	<b>After training</b>
<b>Heart Rate at rest</b> (beats/min)	71	59
<b>Stroke Volume at rest</b> (ml)	75	90
<b>VO<sub>2</sub> max</b> (ml/kg/min)	40.5	49.8

**Table 2**

Explain why these physiological adaptations have occurred, **giving reasons related only to the heart and vascular system.** [5]

[Total: 15 marks]

**Section B**

Answer **one** question only, **either** Question 2 (Scientific Focus)  
**or** Question 3 (Socio-cultural Focus).

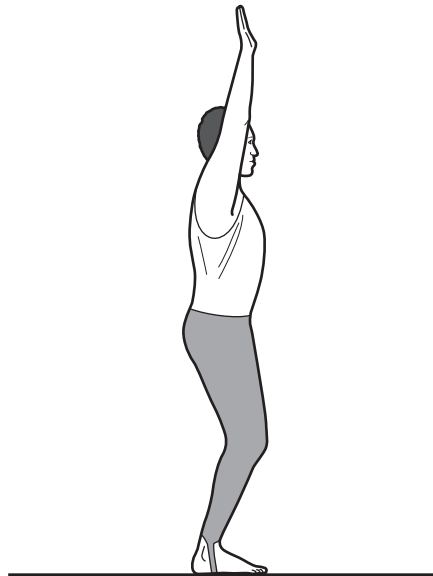
**Question 2 (Scientific Focus)**

You must answer from both Part One **and** Part Two.

**Part One: answer either (a) or (b)****Either**

- (a) (Application of Anatomical and Physiological Knowledge to Improve Performance)

Fig. 1 shows a performer at the moment of take off for a vertical jump.



**Fig. 1**

Sketch Fig. 1 and show the direction of the force acting on the jumper at this point. Describe the type of motion that will be produced as a result of this force giving examples from sport in your answer.

The effect a force can have on a body is explained by Newton's Laws of Motion.

Use your understanding of Newton's Laws to explain how a performer executes a vertical jump.

Aerobic exercise causes changes in heart rate.

Explain how heart rate is regulated referring to neural, hormonal and intrinsic control in your answer.

**Or**

**(b) (Acquiring and Performing Movement Skills)**

Skill classification includes the continuum between simple and complex skills and the continuum between high and low organisation.

Explain each of these two continua giving movement skill examples.

Describe what is meant by gross motor abilities and psychomotor abilities.

What are the characteristics of intrinsic and extrinsic methods of motivation? How would you use these methods to promote effective learning of movement skills?

**Part Two: answer either (c) or (d) or (e)****Either****(c) (Exercise and Sport Physiology)**

Identify, define and give a method of evaluation for **two** components of fitness **other than** aerobic capacity, strength and flexibility.

A carefully planned training programme is required to improve a specific component of fitness.

Describe what is meant by each of the following terms: macrocycles; mesocycles; microcycles. Discuss the benefits of periodisation in planning a training programme.

**Or****(d) (Biomechanical Analysis of Human Movement)**

Using sporting examples identify the three main axes of rotation and state the angular analogues of Newton's Laws of Motion.

Explain how a performer uses the Law of Conservation of Angular Momentum.

**Or****(e) (Psychology of Sport Performance)**

The attributions given by performers for success and failure in sport can affect motivation to continue and to improve.

Outline Weiner's model of attribution.

Use this model to explain how attribution can affect motivation in sport.

When motivation is high and success is experienced, performers in sport are often described as being 'in the zone'.

Describe and explain what is meant by the zone of optimal functioning.

[Total: 45 marks]

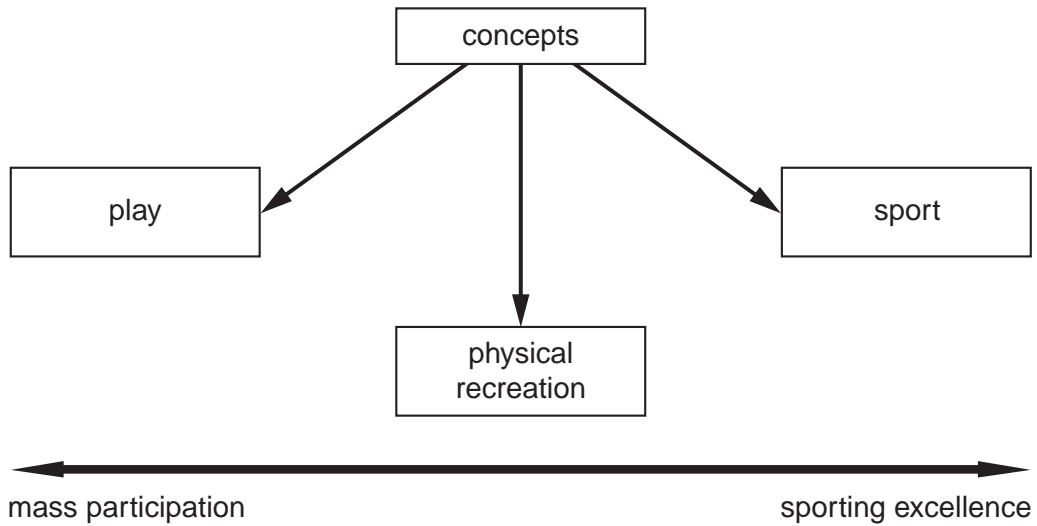
### Question 3 (Socio-cultural Focus)

You must answer from both Part One **and** Part Two.

#### Part One

##### (a) (Contemporary Studies in Physical Education)

Fig. 2 shows the concepts of Play, Physical Recreation and Sport. These concepts are shown in relation to the continuum from mass participation to sporting excellence.



**Fig. 2**

Outline what is meant by the continuum from mass participation to sporting excellence.

Explain each of the three concepts: Play, Physical Recreation and Sport in terms of their characteristics and associated values.

**Part Two: Answer either (b) or (c)****Either****(b) (Historical Studies in Physical Education)**

Public Schools of the late nineteenth century are known for their commitment to sport.

Identify and explain factors that led to sporting excellence in late nineteenth century Public Schools. Your answer should include reference to opportunity and provision for sports and games.

**Or****(c) (Comparative Studies in Physical Education)**

Explain how High Schools and Colleges in the USA help to prepare performers for professional sport.

Compare the United Kingdom Sports Institute (UKSI) with **either** the Institute of Sport in France (INSEP) **or** the Australian Institute of Sport (AIS) in terms of aims, organisation and provision that will help the performer to achieve their potential.

[Total: 45 marks]