

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
ADVANCED GCE**

**2566**

**PHYSICAL EDUCATION**

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

**THURSDAY 4 JUNE 2009: Afternoon**

**DURATION: 1 hour 30 minutes**

**SUITABLE FOR VISUALLY IMPAIRED CANDIDATES**

**Candidates answer on the Answer Booklet**

**OCR SUPPLIED MATERIALS:**

**8 page Answer Booklet**

**OTHER MATERIALS REQUIRED:**

**None**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the spaces provided on the Answer Booklet.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **There are two sections in this paper.**
- **Answer the compulsory questions in Section A and one question from Section B.**

## **INFORMATION FOR CANDIDATES**

- **The number of marks 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.**

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## **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) Fig. 1 shows the energy systems being used at the start of a session of aerobic exercise.

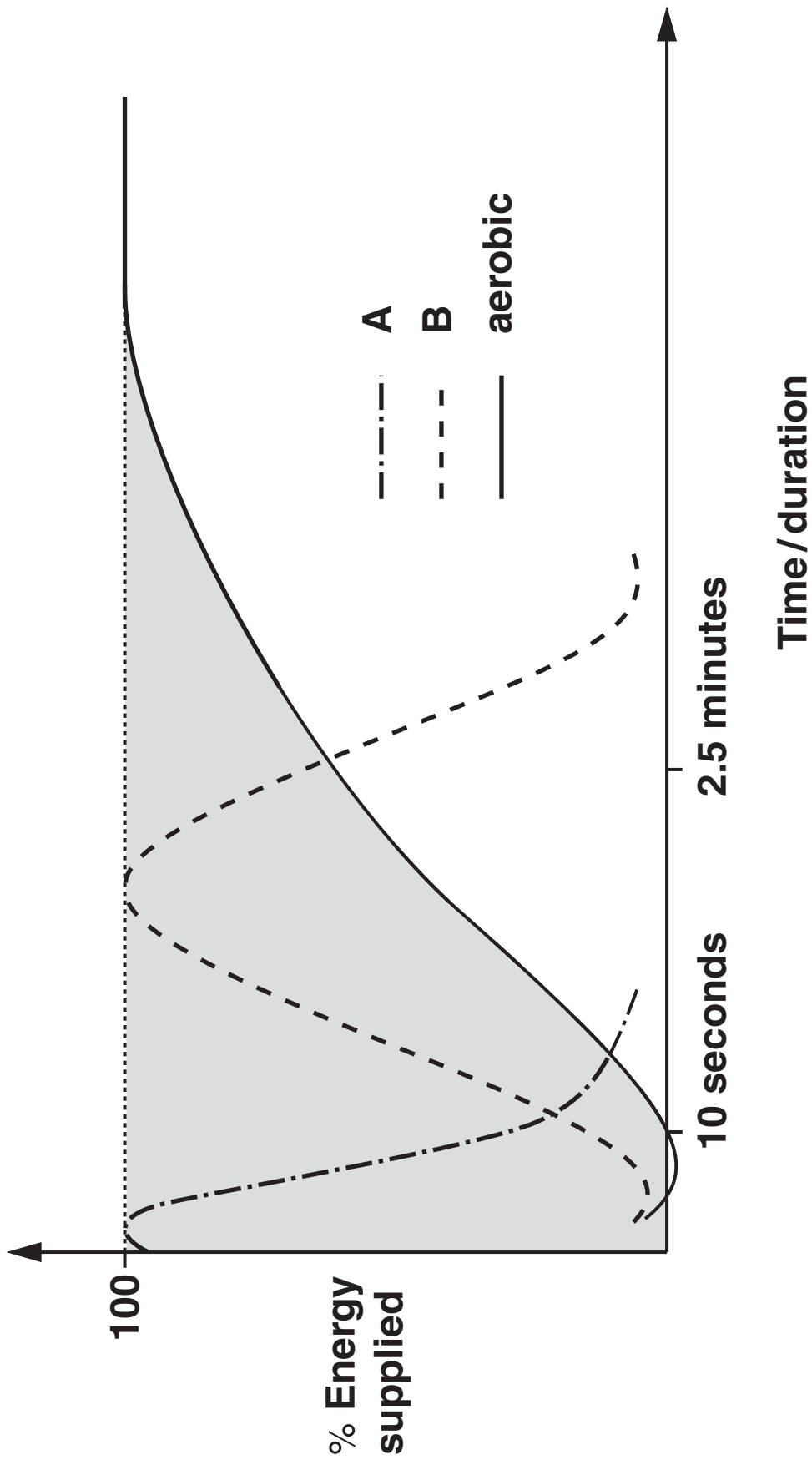


Fig. 1

- (i) The shaded area in Fig. 1 represents the time during which the performer works anaerobically.**

**Identify the energy system A and the energy system B. [2]**

- (ii) During exercise lactic acid will accumulate in the blood and muscles.**

**Describe the effects lactic acid has on the performer's body.**

**Explain how lactic acid is removed from the body. [4]**

- (b) The onset of blood lactate accumulation/OBLA can be expressed as a percentage of  $VO_2$ max.**

**An untrained performer reaches OBLA at 55-60% of  $VO_2$ max.**

**A trained performer can delay OBLA until 85-90% of  $VO_2$ max.**

**Define both OBLA and  $VO_2$ max.**

**Explain the physiological adaptations of aerobic training in skeletal muscle that delay OBLA in a trained performer. [5]**

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(c) Fig. 2 shows how exercise intensity determines the type of food fuel used for energy creation. The duration of exercise can also affect the type of food fuel used.

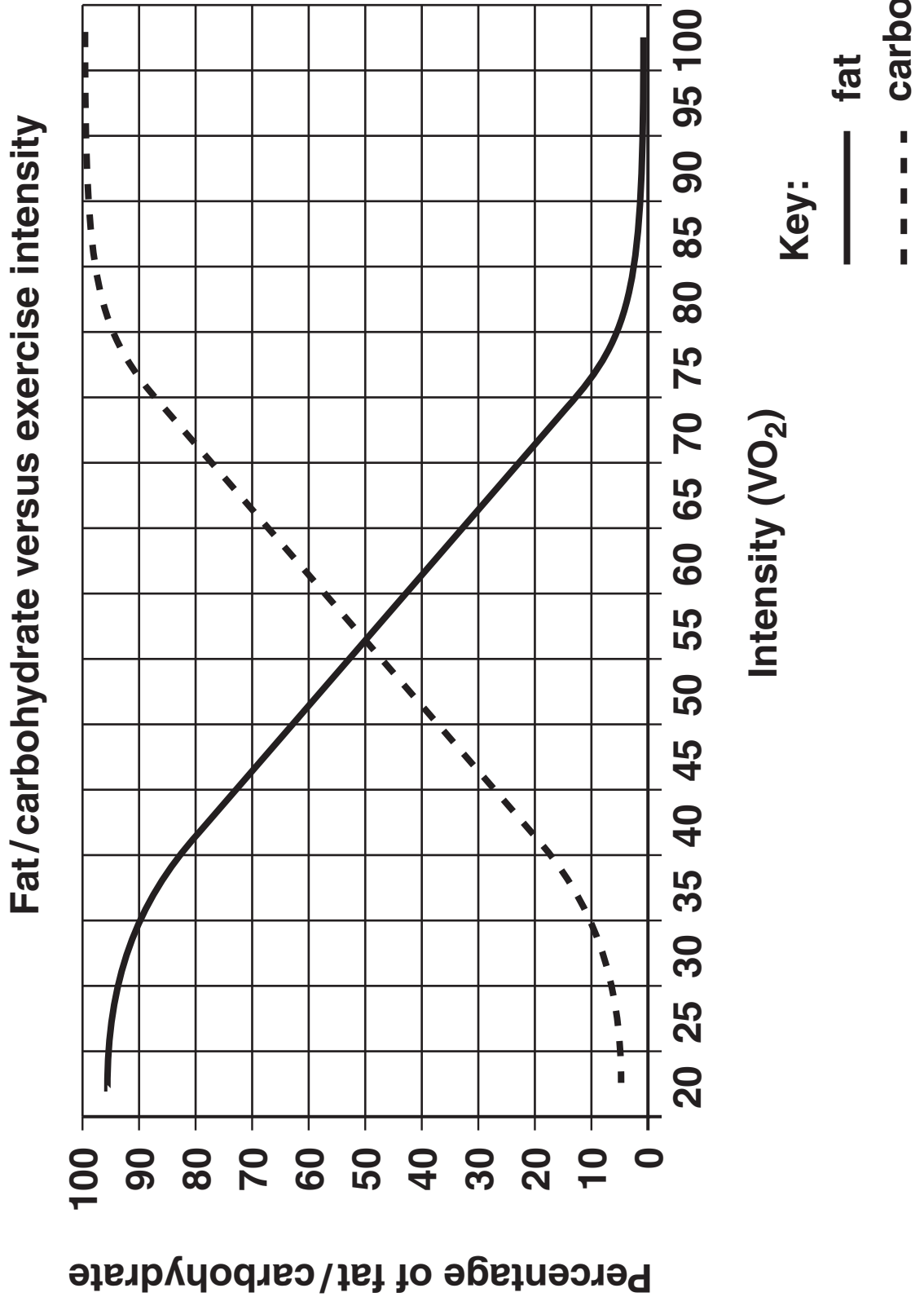


Fig. 2



**Explain how intensity and duration of exercise play such an important role in the type of food fuel used by a performer.**

**[4]**

**[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)**

**Sub-maximal activity is exercise of long duration and low to medium intensity.**

**Sketch a graph to show changes in heart rate before, during and after a long run of sub-maximal exercise intensity.**

**During exercise there will be an increased demand for oxygen by the working muscles.**

**Describe and explain the mechanisms that the body uses to distribute cardiac output during exercise.**

**After exercise, to maintain venous return, a performer may carry out a cool down.**

**Describe the importance of venous return and explain how exercise levels during a cool down help to maintain venous return.**

**OR**

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

**Feedback is important in the learning of movement skills.**

**Explain the main functions of feedback in the learning of movement skills.**

**The transfer of learning can help or hinder the learning of movement skills.**

**Identify and describe THREE different types of transfer that occur in practical performance.**

**Explain how a teacher or coach can ensure transfer of learning HELPS the learning of movement skills.**

**There are a number of theories related to the learning of motor skills in sport.**

**Describe the operant conditioning theory of learning.**

**PART TWO: ANSWER EITHER (c) OR (d) OR (e).**

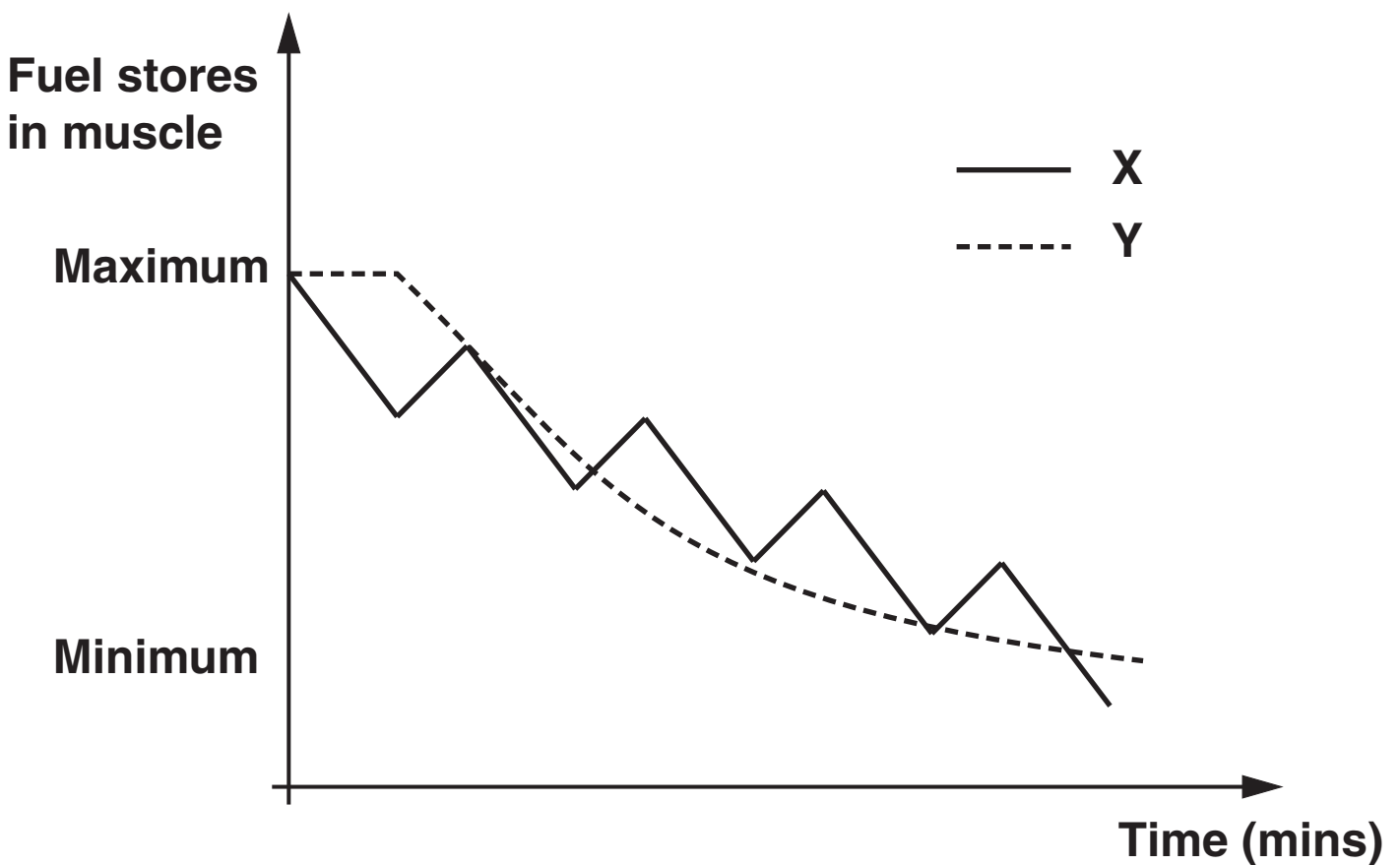
**EITHER**

**(c) (Exercise and Sport Physiology)**

**Strength training requires energy and involves periods of work followed by periods of recovery.**

**Define energy and explain the role of ATP in the muscle.**

**Fig. 3 is a graph to show the changes in fuel stores in the muscle during a typical strength training session.**



**Fig. 3**

**Identify fuel X and fuel Y and describe where in the body they are stored.**

**Explain the shape of the graph for each fuel.**

**Describe and explain the neural and physiological changes that occur to skeletal muscle after a period of aerobic weight training.**

**OR**

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

**Describe what is meant by friction and explain how sports performers manipulate friction to enhance their performance.**

**Spin is often used to control the flight path of balls in sport. Sketch a free body diagram showing all the forces acting on a ball with backspin during flight.**

**Explain how backspin affects the flight path of a ball.**

**OR**

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

**An audience or crowd at a sports event can affect performance both positively and negatively.**

**Explain the possible positive AND negative effects of an audience on sports performance.**

**Concentration is often important for a sports performer.**

**Explain the effect of different attentional styles on performance.**

**Goal setting can help sports performance but the right type of goal needs to be set.**

**Explain what is meant by the setting of process, performance and product goals to improve performance in sport.**

### **QUESTION 3 (SOCIO-CULTURAL FOCUS)**

**You must answer from Part One AND Part Two.**

#### **PART ONE**

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

**Sport, sponsorship and the media are closely related.**

**What is meant by the term sponsorship and what are the roles of the media in contemporary sport?**

**Discuss the relationship between high level sport, sponsorship and the media.**



## **PART TWO: ANSWER EITHER (B) OR (C)**

### **EITHER**

#### **(b) (Historical Studies in Physical Education)**

**Rational sports and recreations emerged after 1850.**

**Discuss the impact of the industrial revolution on the development of rational sports and recreations.**

**Account for the growth of lawn tennis as a rational recreation.**

### **OR**

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

**Sporting excellence is pursued both in local ethnic games and in global international events such as the Olympic Games.**

**Outline the characteristics of ethnic games as they are played in France.**

**Compare the organisational, cultural and geographical factors which affect the production of Olympic champions in the UK with those of either USA or Australia.**

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