



22136602

**SPORTS, EXERCISE AND HEALTH SCIENCE  
STANDARD LEVEL  
PAPER 2**

Monday 6 May 2013 (morning)

1 hour 15 minutes

Candidate session number

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Examination code

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**INSTRUCTIONS TO CANDIDATES**

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all questions.
- Section B: answer one question.
- Write your answers in the boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is *[50 marks]*.



0116

**SECTION A**

Answer **all** questions. Write your answers in the boxes provided.

1. Energy systems provide ATP for muscular contraction. The table below shows the relative contribution of the three energy systems used in different sports. The values are expressed as a percentage.

Sport	ATP-CP and Lactic acid system / %	Lactic acid system and Aerobic / %	Aerobic / %
Basketball	60	20	20
Fencing	90	10	0
Field events	90	10	0
Golf swing	95	5	0
Gymnastics	80	15	5
Hockey	50	20	30
Rowing	20	30	50
Distance running	8	20	72
Soccer	50	20	30
Swimming (distance)	10	20	70
Swimming (50 m freestyle)	40	55	5
Volleyball	80	5	15

[Source: adapted from ML Foss and SJ Keteyian, (1998), *Fox's Physiological Basis for Exercise and Sport*, 6th Edition, page 272]

- (a) Identify the sport that uses the highest percentage of ATP produced via the aerobic system. [1]

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*(Question 1 continued)*

(b) Describe the production of ATP by the lactic acid system. [2]

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(c) Discuss the characteristics of the ATP-CP system and the relative contribution during gymnastics. [3]

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(d) Evaluate the relative contributions of the three energy systems during distance running. [3]

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*(Question 1 continued)*

(e) Explain cardiovascular drift during distance running.

[3]

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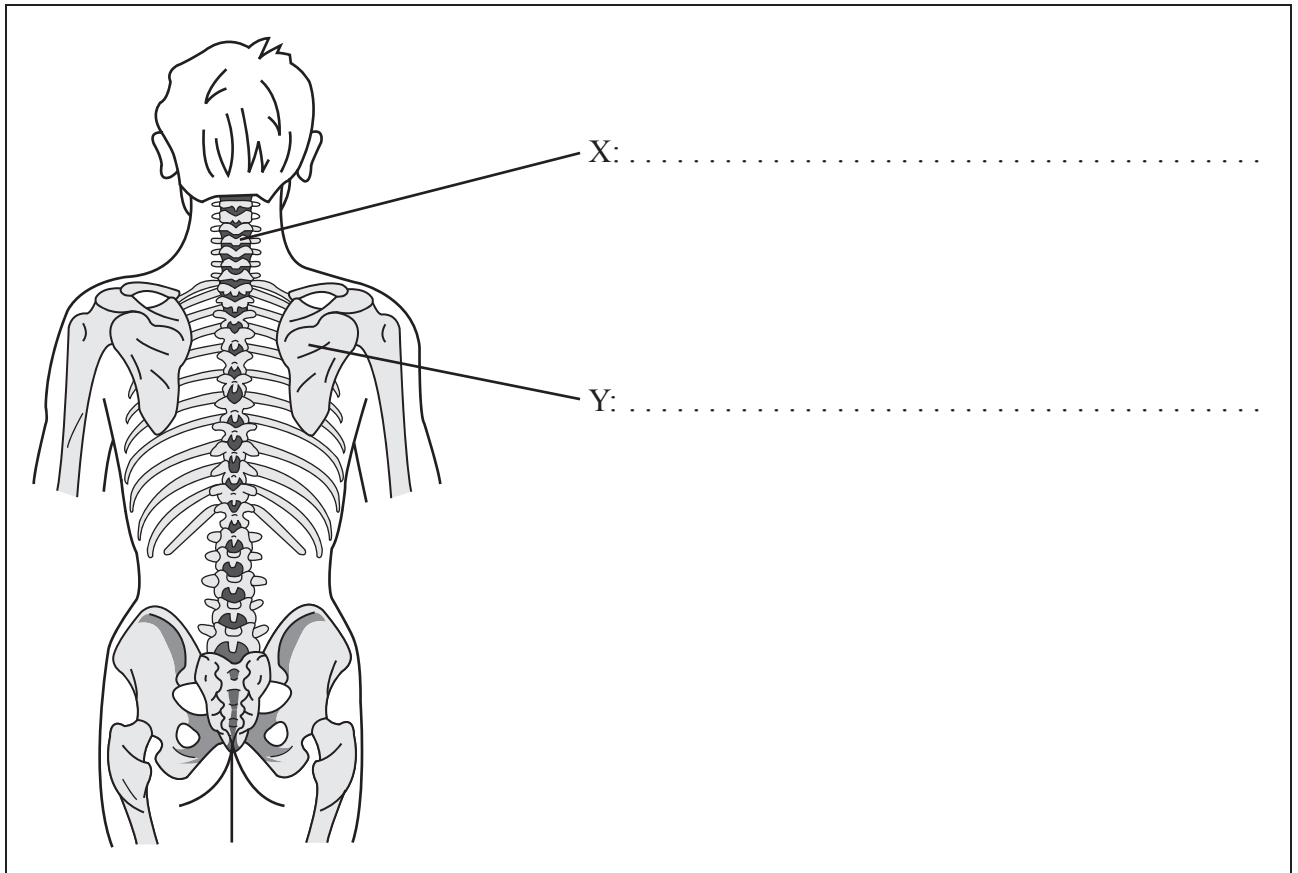
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2. The diagram below shows a cross-section of a human skeleton.



(a) Label bones X and Y on the diagram above. [1]

(b) Distinguish between the anatomical function of the axial and appendicular skeleton. [2]

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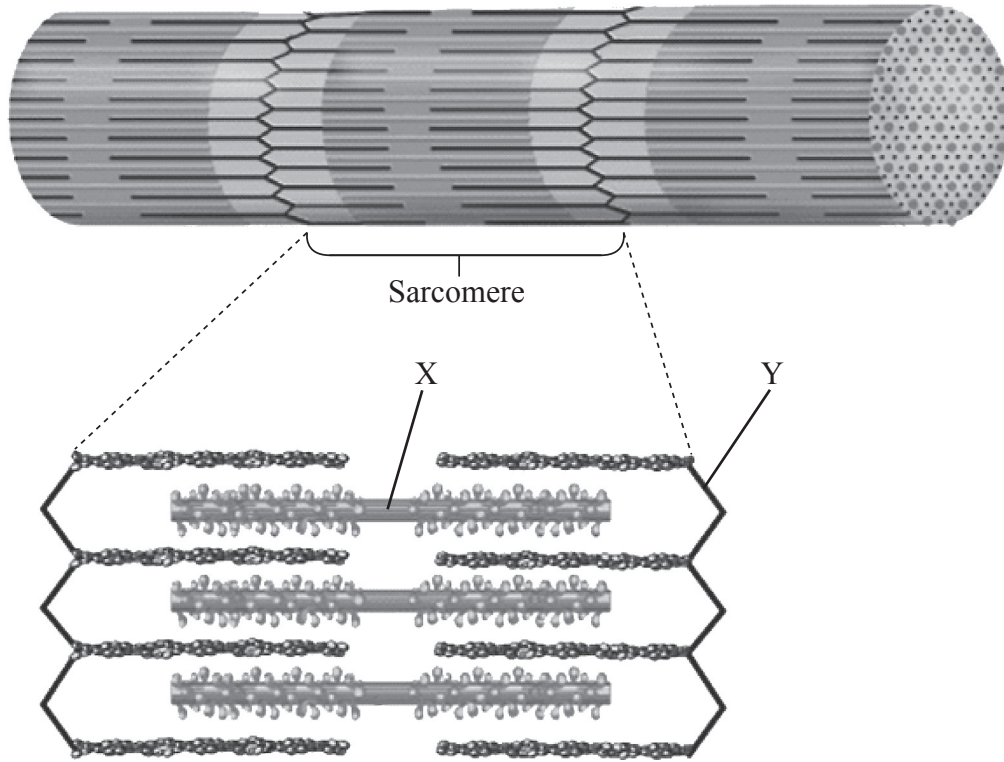
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3. The diagram below shows the components of skeletal muscle when viewed under a microscope.



[Source: adapted from J Honeybourne, M Hill and H Moors, (2000), *Advanced Physical Education & Sport for A Level*, page 28]

(a) Identify the parts labelled X and Y. [1]

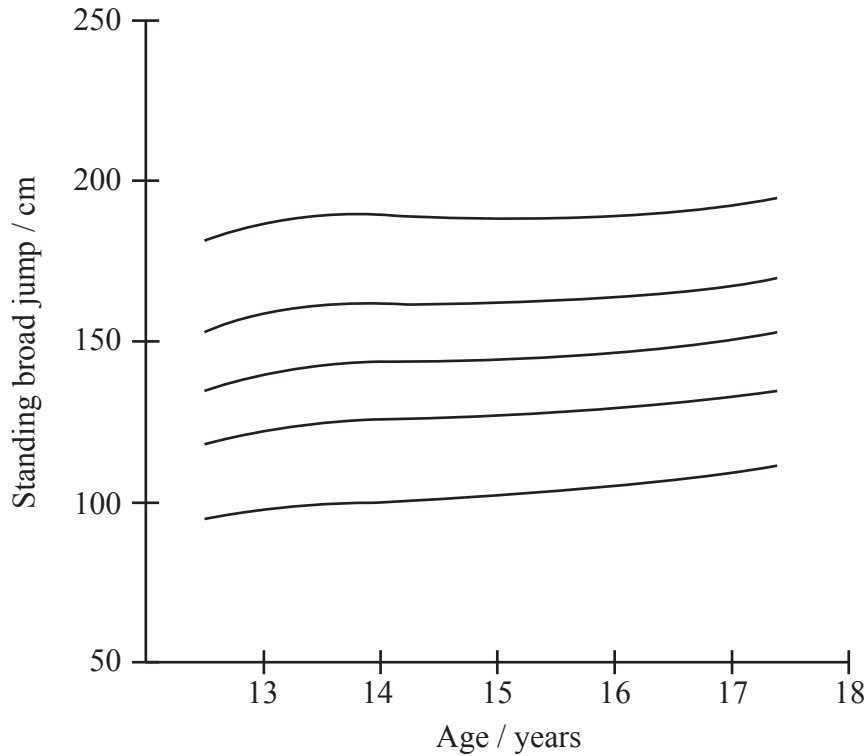
X: .....
Y: .....

(b) Explain the sliding filament theory of muscle contraction. [3]

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4. A study was conducted on adolescent girls from ten European cities to assess performance in the standing broad jump. The results are shown in the graph below.



[Source: FB Ortega, et al., (2011), *British Journal of Sports Medicine*, 45, pages 20–29]

- (a) Identify the component of fitness measured by the standing broad jump. [1]

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- (b) Outline how to conduct the standing broad jump test to ensure reliability. [3]

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(Question 4 continued)

- (c) Discuss the advantages and disadvantages of field testing compared to laboratory testing. [3]

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5. (a) Define the terms:

- (i) *Velocity* [1]

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- (ii) *Momentum* [1]

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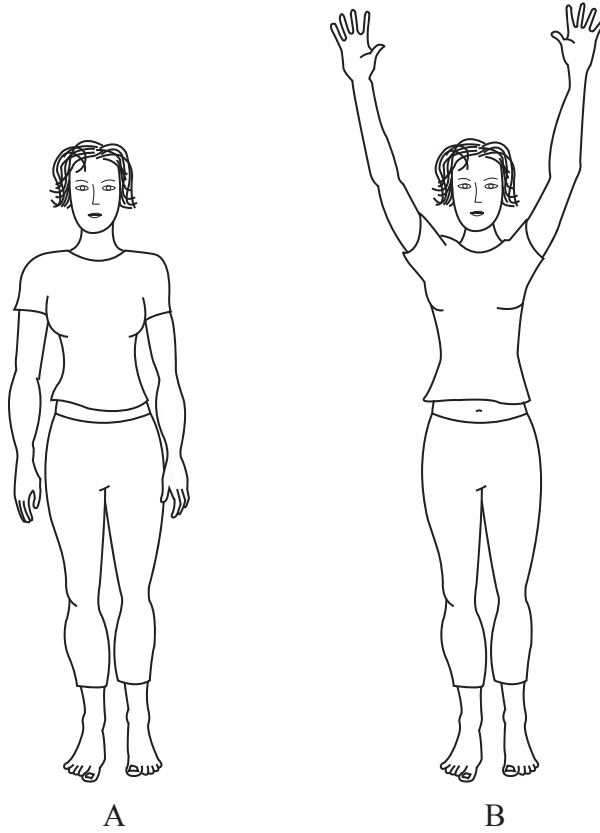
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(Question 5 continued)

(b) Explain what happens to the centre of mass when moving from position A to position B. [2]



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Turn over

**SECTION B**

Answer **one** question. Write your answers in the boxes provided.

6. (a) Describe the concept of angular momentum when a springboard diver is performing a front somersault into the water. [3]
- (b) Outline **three** different approaches to classifying motor skills. [6]
- (c) Outline the functions of the conducting airways in the lungs when an athlete is competing in a marathon. [3]
- (d) Discuss factors that may contribute to the different rates of learning between two divers. [4]
- (e) Explain the role of ATP in muscle contraction. [4]
7. (a) Outline **two** ways exercise intensity can be monitored. [4]
- (b) Describe how a student could apply principles of training to improve their performance on the multistage fitness test. [4]
- (c) Outline the role of hemoglobin in oxygen transport. [3]
- (d) Compare the skill profiles for a gymnast performing a floor routine and a soccer player. [4]
- (e) Explain the role of insulin in the formation of glycogen and the accumulation of body fat. [5]
8. (a) Describe general characteristics common to muscle tissue. [4]
- (b) Outline the concept of reciprocal inhibition. [3]
- (c) Describe the cognitive phase (stage) of learning. [3]
- (d) Compare systolic and diastolic blood pressure response between a flexed arm hang and a chin-up. [4]
- (e) Explain the process of gaseous exchange at the alveoli. [6]



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A large rectangular area containing horizontal dotted lines, indicating a space for writing or drawing.





A large rectangular area with horizontal dotted lines, intended for handwritten notes.





Dotted grid for notes.

