



22126603

**SPORTS, EXERCISE AND HEALTH SCIENCE
STANDARD LEVEL
PAPER 3**

Candidate session number

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Friday 11 May 2012 (morning)

Examination code

1 hour

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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.
- Answer all of the questions from two of the options.
- Write your answers in the boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is *[40 marks]*.



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Option A — Optimizing physiological performance

A1. The programme below shows one week in the preparation phase of a four year training programme of an elite triathlete. The aim is to improve base fitness in time for the London 2012 Olympic Games.

Day	Triathlon Training Plan
Monday	Run: 60 minutes over an uphill and downhill course, keeping heart rate between 60–85 % of maximum heart rate.
Tuesday	Swimming
Wednesday	Rest
Thursday	Cycling: 50 kilometres over an uphill and downhill course, keeping heart rate between 60–90 % of maximum heart rate.
Friday	Weights/resistance training
Saturday	Rest
Sunday	Run: 35 minutes on level ground, keeping heart rate between 60–90 % of maximum heart rate. Each 7 minute period within the 35 minutes involved running at 60 % of maximum heart rate for 5 minutes, followed by 2 minutes at 90 % of maximum heart rate.

(a) State the type of training that occurs on Monday. [1]

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(b) Describe how the triathlete should perform the weights/resistance training on Friday to improve their muscular power. [2]

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(Question A1 continued)

- (c) (i) Discuss the role of the transition phase in an exercise programme. [2]

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- (ii) Suggest **one** type of activity for an elite tennis player during the transition phase of their training programme. [1]

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- (d) Compare the symptoms of overtraining *versus* over-reaching for an elite triathlete. [4]

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A2. Outline how the evaporation of sweat cools an athlete's body during exercise.

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A3. (a) List **two** ergogenic aids that would be considered ethical by the International Olympic Committee (IOC) for an athlete to use. [1]

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(b) Outline, with reference to a specific example, the placebo effect. [2]

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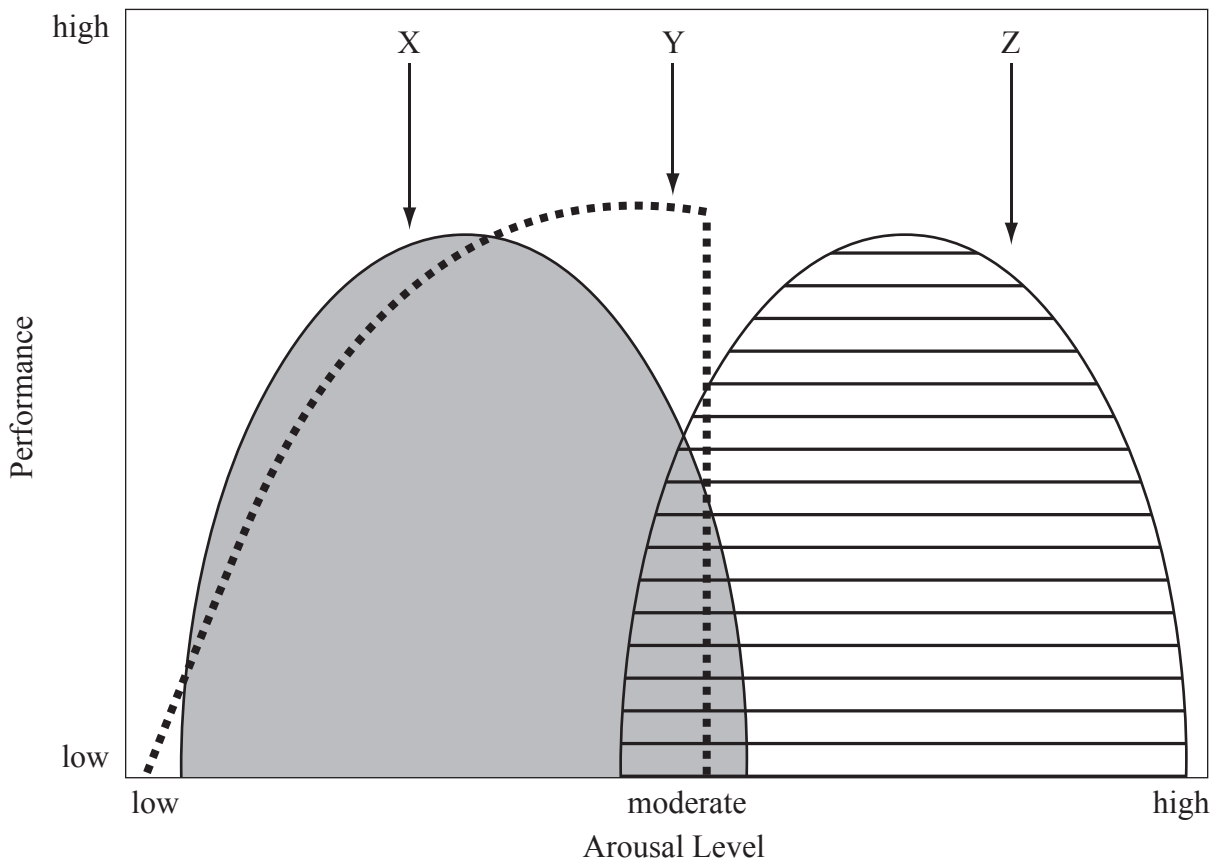
(c) Evaluate the use of erythropoietin (EPO) as an ergogenic aid by an elite triathlete. [4]

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Option B — Psychology of sport

B1. The diagram below shows the arousal and performance level of an athlete during three sporting events.



(a) State the arousal theory illustrated by curve Z.

[1]

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(Question B1 continued)

- (b) Outline how curves X and Y show the optimal arousal levels for the same athlete in different sporting events. [4]

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- (c) Suggest how the emotions of boredom and excitement could influence the arousal and performance of a player in a volleyball match. [4]

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B2. (a) Define the term *personality*.

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(b) Discuss how a sports coach uses social learning theory when using demonstration as a learning tool.

[4]

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B3. An athlete competes for the first time in a 100 m final. Describe the stress process affecting the athlete. [3]

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B4. Discuss the issues associated with intrinsic and extrinsic motivators to exercise. [3]

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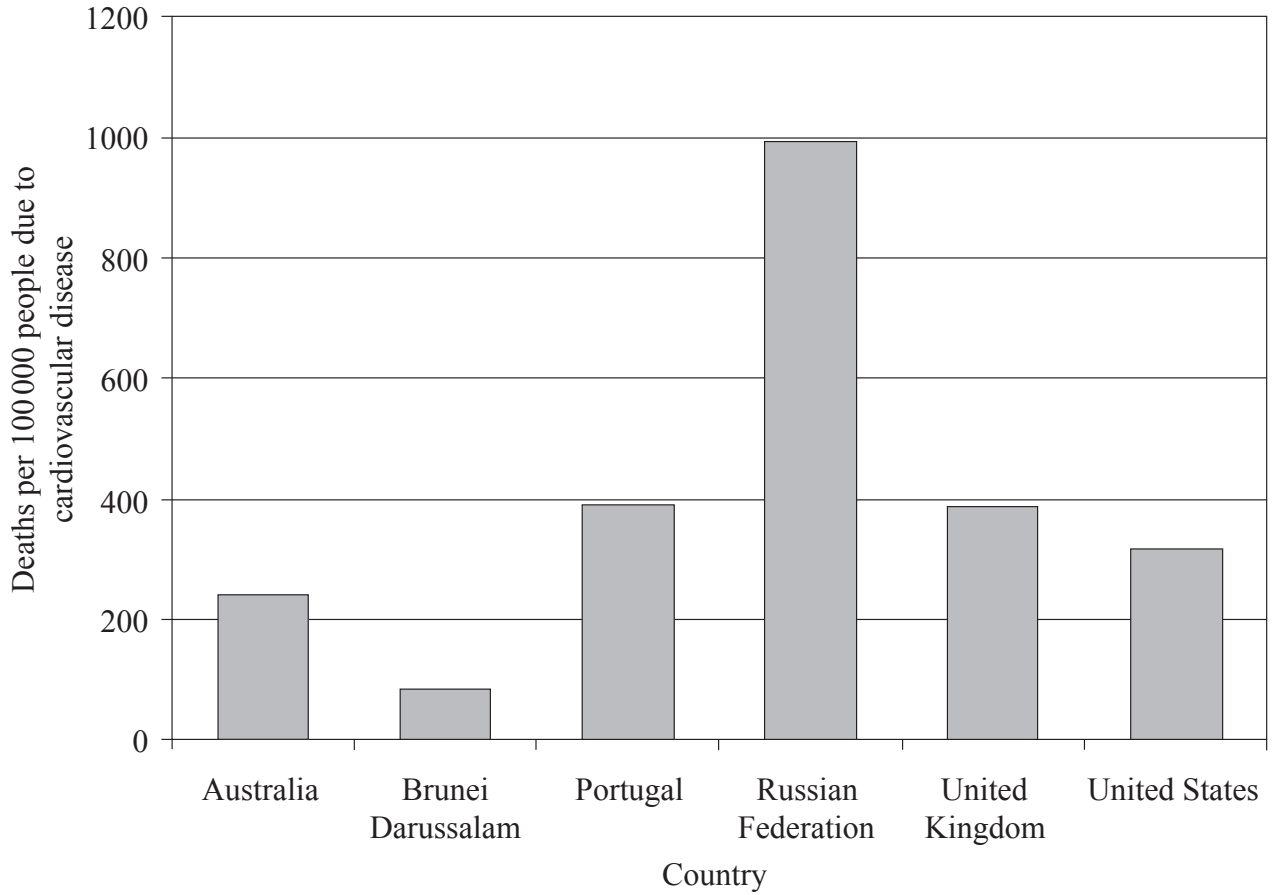
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Option C — Physical activity and health

C1. A 2002 study by the World Health Organization (WHO) investigated the causes of death in United Nations countries. The graph below shows the estimated number of deaths for selected countries due to cardiovascular disease.



[Source: adapted from <http://www.who.int/healthinfo/statistics/bodgbdeathdalyestimates.xls>]

(a) Outline what is meant by the term atherosclerosis.

[1]

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(Question C1 continued)

(b) State which country has the lowest number of deaths due to cardiovascular disease. [1]

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(c) State the number of deaths in Portugal per 100 000 people due to cardiovascular disease. [1]

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(d) Suggest risk factors associated with cardiovascular disease in countries such as the Russian Federation. [4]

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C2. (a) Identify the health risks that can result from having diabetes.

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(b) Distinguish between *type 1* and *type 2 diabetes*.

[4]

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C3. Outline why females are more at risk of osteoporosis than males of a similar age. [2]

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C4. Discuss **two** potential physical barriers to physical activity. [4]

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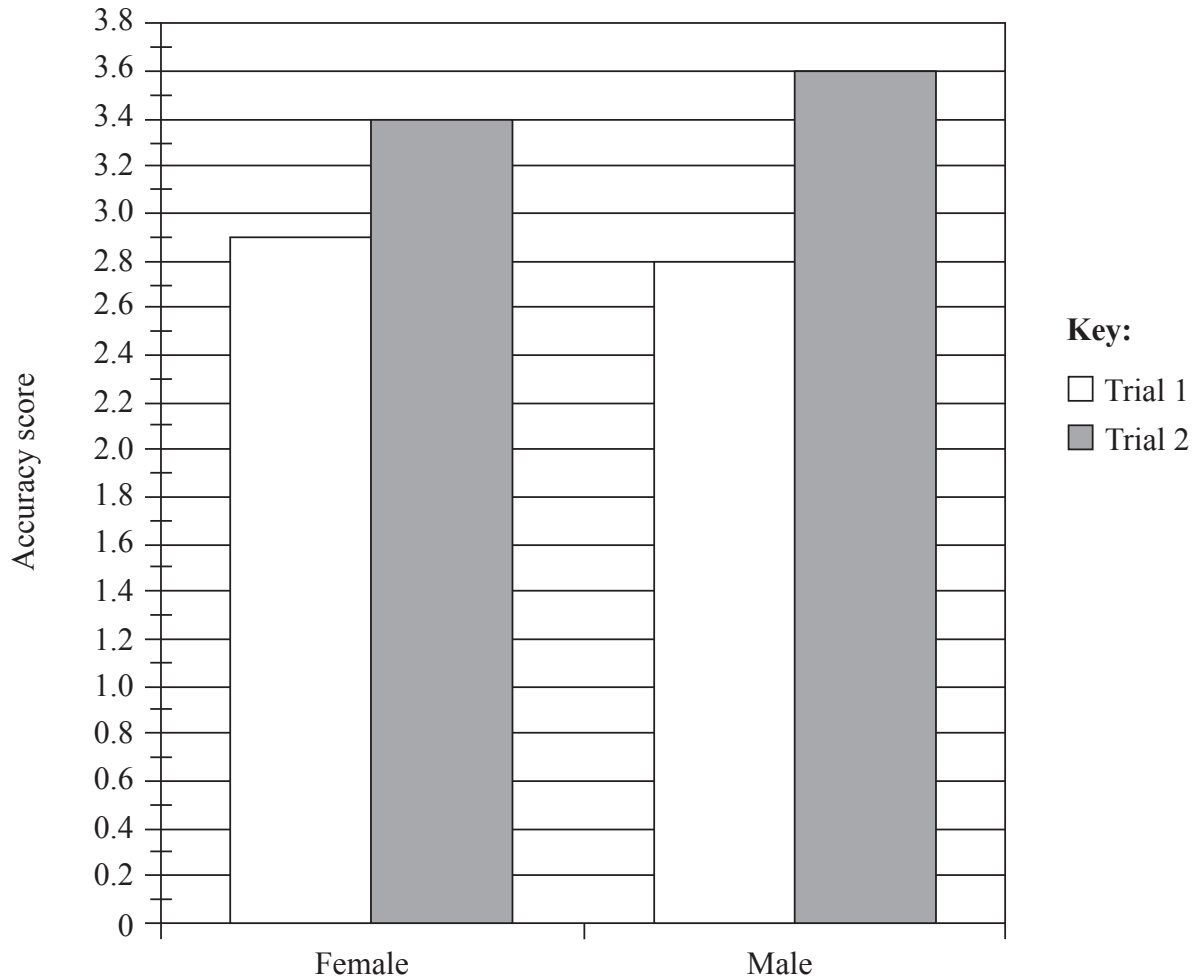


Option D — Nutrition for sport, exercise and health

D1. Motor skill performance was examined in male and female cricket bowlers. Two experimental trials were performed in random order:

- Trial 1 in a dehydrated state
- Trial 2 in a well hydrated state

The graph below shows the results for bowling accuracy score. A higher bowling accuracy score indicates a bowl close to the target line.



[Source: adapted from Devlin, *et al.*, (2001), *Journal of Science and Medicine in Sport*, 4, pages 179–187]

(a) Calculate the change in accuracy score for males in Trial 1 and Trial 2. [1]

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(Question D1 continued)

(b) Compare water distribution in trained and untrained athletes.

[4]

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(c) Outline methods a cricketer could use to monitor their hydration status.

[3]

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(d) Discuss why endurance athletes require a greater water intake.

[3]

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D2. Outline dietary practices employed by athletes to manipulate body composition.

[2]

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D3. Describe the absorption of amino acids from the intestinal lumen into the capillary network.

[2]

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- D4.** (a) State the relative amounts of glycogen in type I and type IIb muscle fibres. [1]

Type I:

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Type IIb:

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- (b) Explain how an elite marathon runner could manipulate their carbohydrate intake and training load prior to a major race to maximize performance. [4]

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