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

Candidate session number

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Tuesday 7 May 2013 (afternoon)

Examination code

1 hour

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INSTRUCTIONS TO CANDIDATES

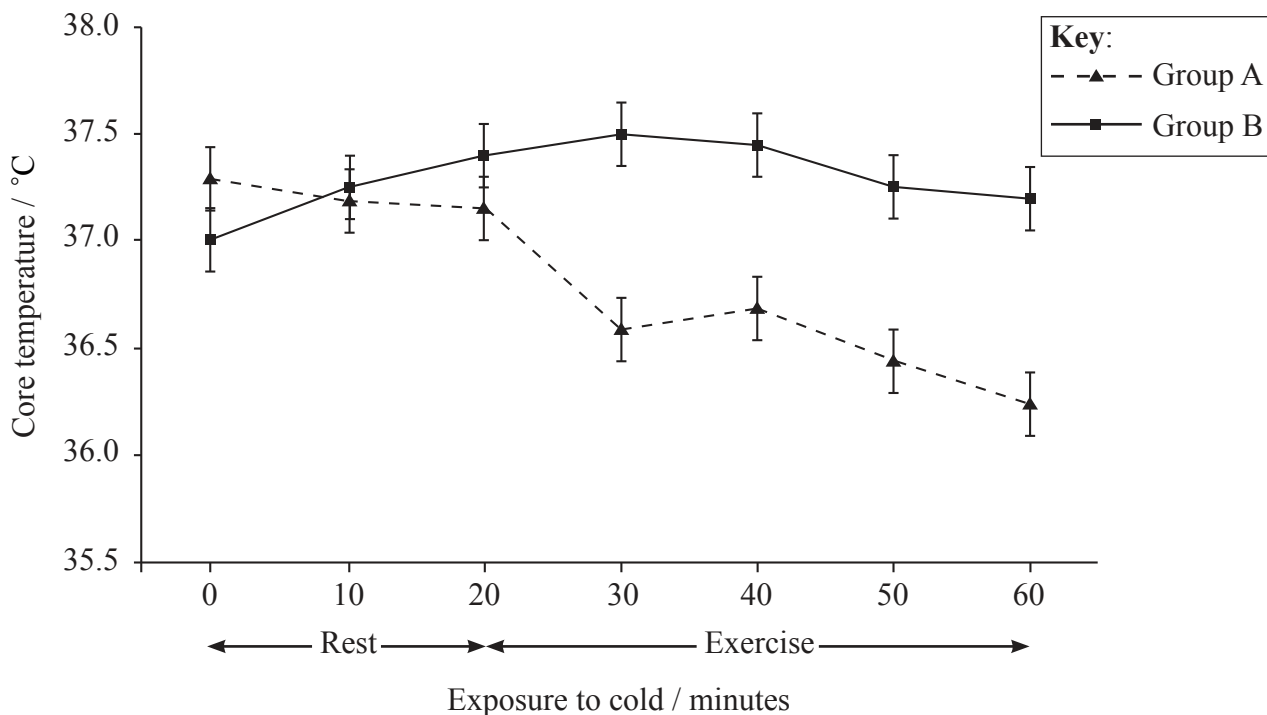
- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all questions from two options.
- Write your answers in the boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is *[40 marks]*.



0120

Option A — Optimizing physiological performance

A1. A study investigated thermoregulation during rest and exercise in a cold environment test with two groups (group A and group B) of female cyclists. Both groups rested for 20 minutes and then cycled at 30% VO₂ max for 40 minutes in a cold environment. The core temperature results are shown below.



[Source: P Klenrou, *et al.*, (2004), *Journal of Applied Physiology*, **96**, pages 1393–1398]

(a) State, with appropriate units, the core temperature for group A at the beginning of the cold environment test. [1]

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(b) State what happens to the core temperature for group B during the 20 minute rest period. [1]

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(Question A1 continued)

(c) Compare the core temperature for both groups during exercise.

[3]

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(d) Outline **one** health risk of exercising in the cold.

[2]

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A2. (a) Distinguish between overtraining and over-reaching. [2]

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(b) Describe resistance training to improve strength. [2]

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(c) Discuss how the three phases of periodization should be organized to optimize performance and avoid overtraining. [3]

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A3. (a) Define the term *ergogenic aid*.

[1]

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(b) Outline the possible harmful effects of long-term use of erythropoietin (EPO).

[2]

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(c) Discuss the benefits that an athlete would hope to gain by using caffeine.

[3]

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Option B — Psychology of sport

B1. A study investigated the influence of parents on sporting participation for two groups of Canadian female adolescents. Group A were from the Anglo Canadian culture and group B were from the East Indian Canadian culture. The average percentage responses for each group are shown below.

My parents...	Group A / %	Group B / %
drive me to sport practices and competitions.	83	89
bring snacks for me to my sport practices.	17	22
encourage me with healthy eating habits.	25	33
come to watch my practices and competitions.	83	68
ask me about my sport participation.	33	22
are proud of my sporting accomplishments.	33	33
push me to be better at sport.	17	22
sometimes participate in sport with me.	42	44
used to play my sport.	50	22
pressure me not to drop out.	17	33

[Source: J Bhalla and M Weiss, (2010), *Research Quarterly for Exercise & Sport*, **81** (4), pages 494–505]

(a) State which group had parents who were most likely to encourage healthy eating habits. [1]

(b) Identify which response shows no difference between groups. [1]

(This question continues on the following page)



(Question B1 continued)

(c) Discuss intrinsic motives for participating in sport and exercise.

[3]

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0720

Turn over

B2. (a) Sports psychologists often work with athletes who suffer from anxiety. Define the term *anxiety*. [1]

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(b) Outline the use of self-talk techniques to improve performance on a maximal fitness test. [3]

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(c) Evaluate the use of mental imagery to improve sporting performance. [4]

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B3. (a) Outline issues associated with the measurement of personality. [2]

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(b) Outline why the interactionist approach improves understanding of personality in sport. [2]

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(c) Evaluate issues in research on the personalities of athletes and non-athletes. [3]

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Option C — Physical activity and health

C1. A study investigated whether an exercise programme had an effect on anxiety, depression and body image in females recovering from medical treatment. Questionnaires were administered pre (before) and post (after) the ten-week exercise programme to either an exercise group or a control group.

The mean (\pm SD) scores for both groups are shown below. Lower scores indicate less anxiety and less depression and a more positive body image.

	Anxiety		Depression		Body image	
	Pre	Post	Pre	Post	Pre	Post
Exercise group	6.50 (3.90)	4.83 (3.46)	4.17 (3.83)	2.70 (2.95)	6.20 (2.57)	5.47 (1.66)
Control group	6.96 (4.80)	7.14 (4.97)	4.79 (4.57)	4.64 (4.43)	7.21 (2.59)	6.82 (2.60)

[Source: A Mehnert, *et al.*, (2011), *Onkologie*, 34, pages 248–253]

(a) (i) Identify which group had the greatest mean pre to post change in their depression score. [1]

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(ii) Identify which group had the least variance in anxiety post the ten-week exercise programme. [1]

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(Question C1 continued)

(b) Distinguish between groups for body image scores.

[2]

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(c) Explain the role of exercise in reducing the effects of anxiety and depression.

[3]

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C2. (a) Outline physical activity guidelines for the promotion of good health in adults. [2]

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(b) The UK government has set a target of “70% of the population to be reasonably active by 2020”. Discuss the physical barriers to participation in physical activity. [3]

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C3. (a) A recent study has shown that runners are less likely to suffer from coronary heart disease. Outline the coronary circulation. [2]

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(b) Explain the concept of risk factors in cardiovascular disease. [3]

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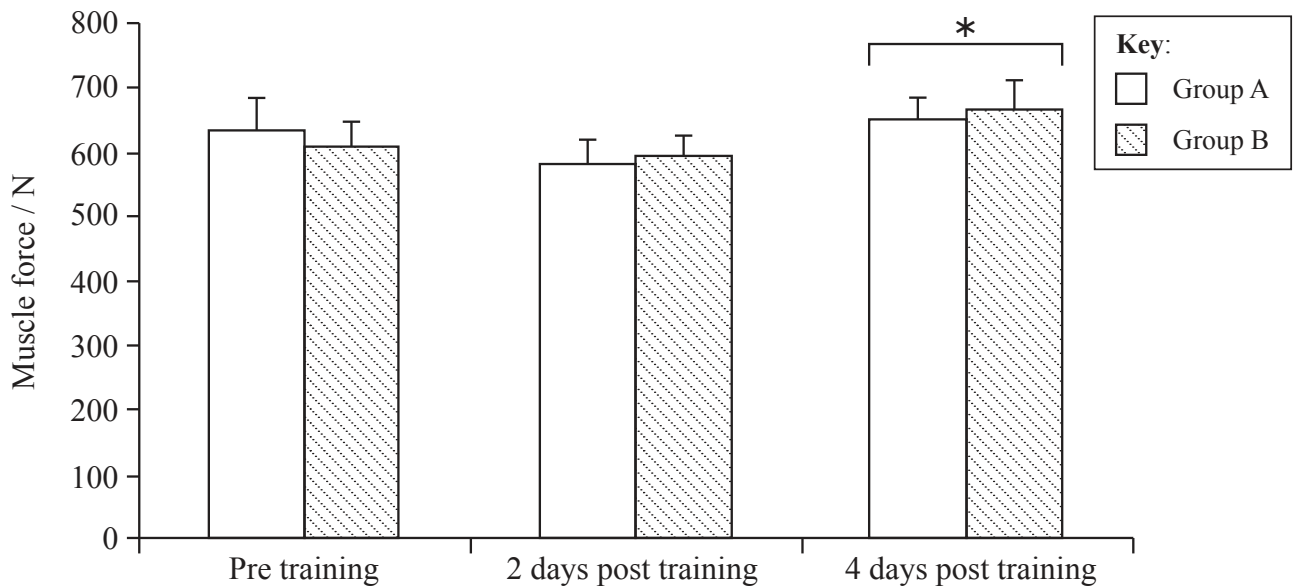
(c) Discuss the relationship between major changes in society and hypokinetic disease. [3]

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Option D — Nutrition for sport, exercise and health

D1. The timing and composition of sports drink ingestion can influence recovery from heavy exercise. A study investigated the effectiveness of sports drinks with two groups of soccer players during training. Group A ingested a carbohydrate drink and group B ingested a carbohydrate and protein drink. The muscle force of both groups was recorded pre (before) training, and two days and four days post (after) training. The results are shown below.



* < 0.05 i.e. significantly different than pre training

[Source: S Gilson, *et al.*, (2010), *Journal of the International Society of Sports Nutrition*, 7(19)]

(a) State which group had the highest muscle force pre training. [1]

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(b) Distinguish the effects of ingesting the two different sports drinks on muscle force two days post training. [2]

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(Question D1 continued)

- (c) Discuss the use of nutritional ergogenic aids to improve performance in soccer. [3]

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D2. (a) List **two** enzymes responsible for the digestion of proteins. [1]

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(b) Describe the absorption of glucose from the intestinal lumen to the capillary network. [2]

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(c) Outline the role of enzymes in digestion. [2]

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D3. (a) Describe how the hydration status of a hockey player can be monitored. [3]

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(b) Explain how the body can regulate its internal environment by negative feedback mechanisms. [3]

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(c) Discuss why drinking too much water during prolonged exercise can impair performance. [3]

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