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

Candidate session number

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Thursday 7 November 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 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].

Option	Questions
Option A — Optimizing physiological performance	1 – 3
Option B — Psychology of sport	4 – 7
Option C — Physical activity and health	8 – 11
Option D — Nutrition for sport, exercise and health	12 – 14



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**Option A — Optimizing physiological performance**

1. A study compared the effect of two types of training on balance. Subjects were randomly assigned to one of three groups and were tested before and after the 20-week training period.
  - Group 1 followed a physical training programme
  - Group 2 participated in video games training
  - Group 3 did no physical or video games training (control group).

Subjects balanced on one foot for 30 seconds and the number of times their other foot touched the ground was counted. This test was performed with their eyes open, and then with their eyes closed. The mean results are shown in the table below.

	Group 1		Group 2		Group 3	
	Before	After	Before	After	Before	After
Eyes open	19.7	8.7	17.8	14.5	19.0	18.1
Eyes closed	23.2	11.5	19.8	15.0	26.1	30.4

[Source: adapted from C Toulotte *et al.*, (2012), *Clinical Rehabilitation*, 26 (9), pages 827–835]

- (a) Identify which group touched the ground the highest number of times with their eyes closed after training. [1]

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- (b) Calculate the difference between before and after training for Group 2 with their eyes open. [1]

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*(Option A continues on the following page)*



*(Option A, question 1 continued)*

- (c) Outline training methods that could be used to improve flexibility. [2]

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2. The 2022 soccer world cup will take place in Qatar in a hot environment.

- (a) Outline how the body thermoregulates in hot environments. [2]

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- (b) Describe how a team should acclimatize to heat stress. [2]

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*(Option A continues on the following page)*



*(Option A, question 2 continued)*

- (c) Discuss the physiological adaptations that occur with heat acclimatization in soccer players over a two-week period. [3]

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- (d) Discuss possible indicators of overtraining for soccer players. [3]

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*(Option A continues on the following page)*



*(Option A continued)*

3. (a) Describe the placebo effect with reference to a suitable sporting example. [2]

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- (b) Discuss the benefits that some athletes would hope to gain by using the following non-nutritional ergogenic aids:

- (i) Erythropoietin (EPO) [2]

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- (ii) Beta blockers [2]

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**End of Option A**



**Option B — Psychology of sport**

4. A study looked at the effect of performance enhancing drugs on personality traits of adult bodybuilders. Subjects in Group 1 tested positive for use of anabolic steroids and subjects in Group 2 tested negative for use of drugs (drug-free).

The table below shows the mean ( $\pm$  SD) group scores for four personality traits. A high score indicates greater levels of the personality trait.

Personality trait	Group 1	Group 2
Aggressive	66.0 $\pm$ 6.5	47.0 $\pm$ 5.5
Easily annoyed	61.5 $\pm$ 9.5	57.0 $\pm$ 9.0
Kind and helpful	40.5 $\pm$ 8.0	54.0 $\pm$ 4.5
Difficulty in relaxing	60.0 $\pm$ 11.0	52.5 $\pm$ 8.5

[Source: adapted from N Galligani *et al.*, (1996), *Hormones and Behavior*, **30**, pages 170–175]

- (a) State which group is most kind and helpful. [1]

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- (b) Identify which group has a wider spread of values around the mean for difficulty in relaxing. [1]

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*(Option B continues on the following page)*



*(Option B, question 4 continued)*

- (c) Evaluate the issues in personality research and sports performance. [3]

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- 5. (a) Explain how extrinsic rewards may affect the intrinsic motivation of a professional sports person. [2]

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- (b) Describe how sports coaches could apply Weiner’s Attribution Theory when their team lose a major competition. [3]

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*(Option B continues on the following page)*



*(Option B continued)*

6. (a) Discuss the emotions that may influence a player's performance in the final of a competition. [3]

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- (b) Describe the actual behaviours (outcome) that athletes may show as part of the stress process. [3]

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*(Option B continues on the following page)*





*(Option B continued)*

7. (a) Distinguish between external and internal imagery when performing a sports skill. [2]

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- (b) Outline the biofeedback relaxation technique. [2]

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**End of Option B**



**Option C — Physical activity and health**

- 8. A study assessed the health risk factors in females and males of three ethnic groups living in Amsterdam. Data from the interview and a medical examination are shown in the table below.

	White Dutch		South American		Asian	
	Females / %	Males / %	Females / %	Males / %	Females / %	Males / %
Participates in sport	43.0	40.2	25.6	37.8	25.8	32.2
High blood pressure	28.9	50.4	46.6	60.6	51.1	52.4
Diabetes	5.8	7.8	12.8	11.9	25.8	24.8
Cigarette smoker	43.3	42.2	28.2	55.5	21.4	53.1

[Source: adapted from C Agyemang *et al.*, (2012), *Diabetic Medicine*, 29 (9), pages 1159–1164]

- (a) State which ethnic group has the lowest percentage of males who have high blood pressure. [1]

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- (b) Identify which ethnic group has the biggest difference between female and male cigarette smokers. [1]

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*(Option C continues on the following page)*



*(Option C, question 8 continued)*

- (c) Explain the major risk factors associated with cardiovascular disease. [3]

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9. (a) Discuss the factors that could lead to osteoporosis in adults. [3]

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- (b) Outline the longer-term consequences of fractures from osteoporosis. [2]

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*(Option C continues on the following page)*



*(Option C continued)*

10. (a) Identify **one** technique used to measure obesity. [1]

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(b) Describe why individuals with a hypokinetic disease are encouraged to exercise. [3]

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(c) Discuss the potential physical barriers to exercise. [3]

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*(Option C continues on the following page)*



(Option C continued)

11. (a) Define the term *mood*. [1]

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(b) Identify **two** effects of exercise on mood states. [2]

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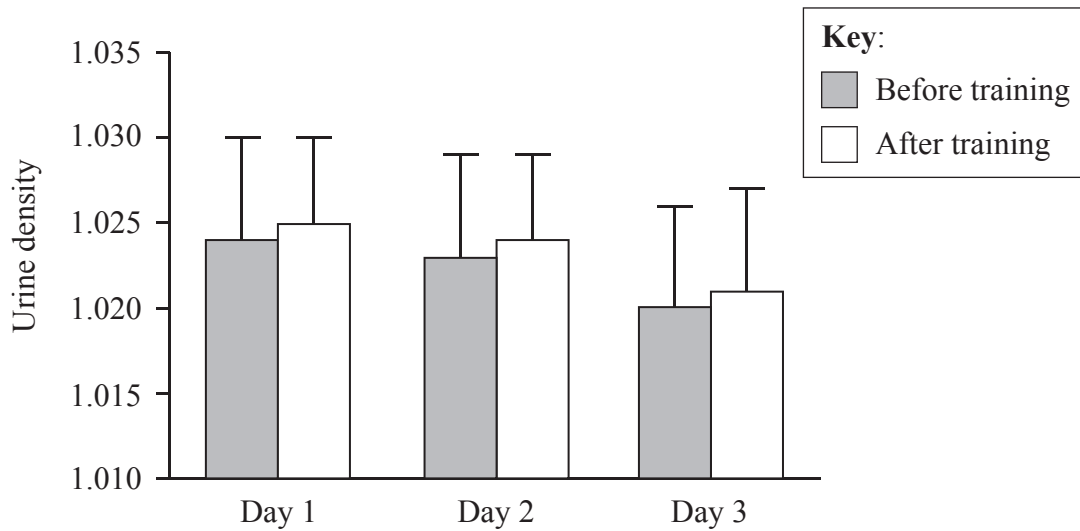
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**End of Option C**



**Option D — Nutrition for sport, exercise and health**

12. A study assessed the fluid balance of Brazilian youth soccer players during three consecutive days of training. The urine density in comparison to pure water was recorded before and after training. The mean ( $\pm$  SD) urine density for each day is shown below.



[Source: R P Silva *et al.*, (2011), *Journal of Sports Sciences*, 29 (7), pages 725–732]

- (a) State the urine density for day 3 before training. [1]

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- (b) Distinguish between the before training and after training urine density of the soccer players. [2]

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*(Option D continues on the following page)*



*(Option D, question 12 continued)*

- (c) Compare water distribution in trained and untrained individuals. [4]

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13. (a) Outline the features of **two** principal components of the digestive system. [2]

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- (b) Explain the need for enzymes in digesting a meal before a competition. [3]

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*(Option D continues on the following page)*



(Option D continued)

14. (a) Define the term *basal metabolic rate (BMR)*. [1]

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(b) Describe the association between body composition and athletic performance. [3]

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(c) Discuss the interaction of carbohydrate loading and training programme modification that an athlete could use before a competition. [4]

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**End of Option D**

