Diploma Programme
Programme du diplôme
Programa del Diploma

Sports, exercise and health science
Standard level
Paper 3

Tuesday 16 May 2017 (morning)

1 hour

Candidate session number

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.
- Answers must be written within the answer 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 – 4
Option B — Psychology of sport	5 – 8
Option C — Physical activity and health	9 – 12
Option D — Nutrition for sport, exercise and health	13 – 15

16EP01

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Option A — Optimizing physiological performance

1. A study investigated sweat rate in endurance-trained cyclists. Two groups of cyclists followed a 10-day training programme. The experimental group trained in an environment at 40°C and the control group trained at 13°C. Sweat rate was measured at rest and at three increasing exercise intensities in 40°C and 13°C environments. The results are shown in the following diagram.
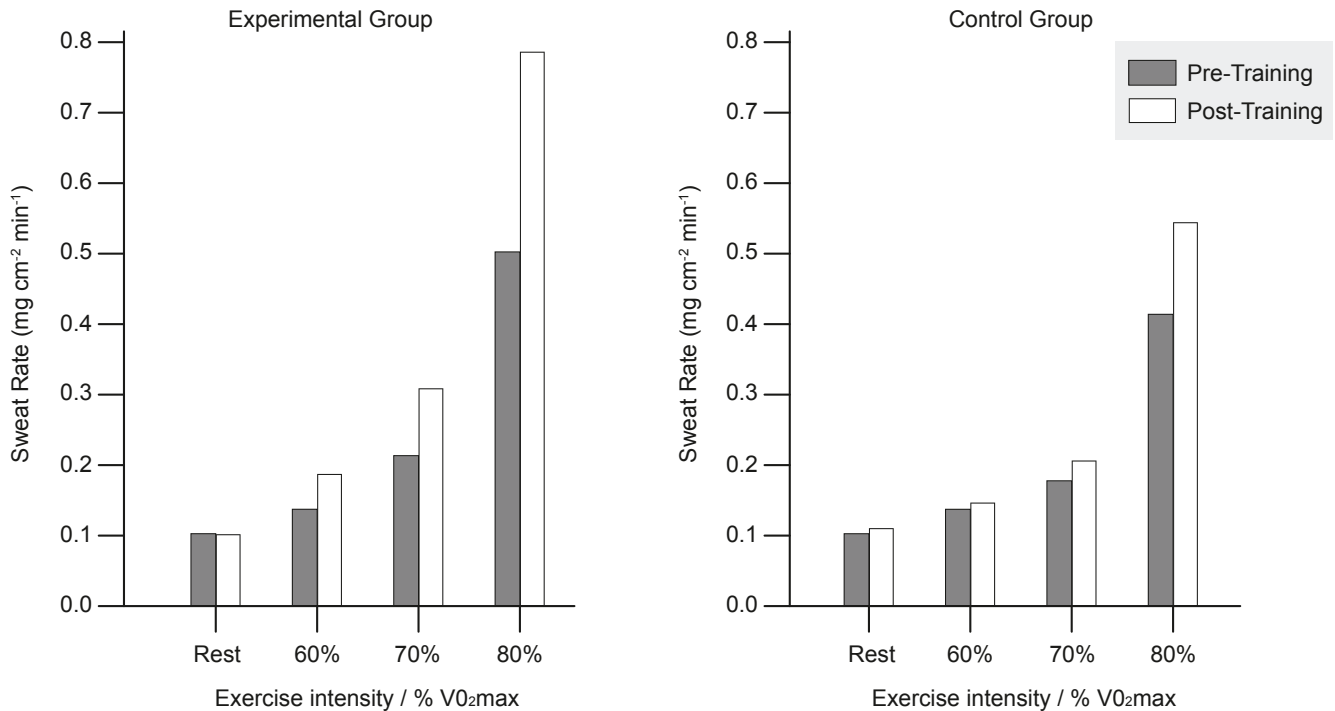
[Source: S Lorenzo and C Minson, (2010), *Journal of Applied Physiology*, pages 1736–1743]

   (a) Identify the group and exercise intensity with the highest post-training sweat rate. [2]

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(Option A continues on the following page)

(Option A, question 1 continued)

(b)   Calculate the difference in sweat rate between the 80 % VO_2max and the rest
       conditions for the experimental group pre-training.   [2]

(c)   Compare sweat rate responses for the experimental and control groups.   [2]

(d)   Outline the physiological adaptations impacting the sweat mechanism that occur with
       heat acclimatization.   [2]

(Option A continues on the following page)

(Option A continued)

2.   (a)   State the normal physiological range for core body temperature.   [1]

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. . . .

(b)   Explain the characteristics of heat stroke.   [2]

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3.   (a)   Define *ergogenic aid*.   [1]

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(b)   Outline **two** possible harmful effects of long term use of anabolic steroids.   [2]

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(Option A continues on the following page)

(Option A, question 3 continued)

     (c)   Discuss the benefits for athletes of using beta blockers. [3]

4.   Explain indicators of over-training. [3]

End of Option A

Turn over

Option B — Psychology of sport

5.   A recent study investigated motivation among ten-pin bowlers. They were asked why they practised sport. The table below shows the mean scores for responses, with higher scores indicating a higher level of intrinsic motivation.

		Mean score	
Item	**Reasons for practising sport**	**Male**	**Female**
1	To know more about my sport	5.16 (1.51)	4.60 (1.84)
2	To discover new training techniques	5.47 (1.54)	4.85 (1.53)
3	To master difficult techniques	5.50 (1.45)	4.86 (1.61)
4	To improve my weak points	5.20 (1.63)	4.68 (1.56)
5	To learn new training techniques	5.27 (1.57)	4.67 (1.56)
6	To discover new strategies	5.46 (1.28)	4.39 (1.71)

[Source: Eng-Wah Teo, Selina Khoo, Rebecca Wong, Eng-Hoe Wee, Boon-Hooi Lim and Shabesan Sit Rengasamy (2015) 'Intrinsic and Extrinsic Motivation Among Adolescent Ten-Pin Bowlers in Kuala Lumpur, Malaysia.' *Journal of Human Kinetics*, pages 241–251.]

(a)   State the score in the table with the greatest spread of data.   [1]

....

....

(b)   Calculate the difference between the lowest male and lowest female mean scores.   [2]

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(Option B continues on the following page)

(Option B, question 5 continued)

(c) By considering items 2 and 3, compare and contrast the mean scores of males and females. [2]

(d) Outline extrinsic motivation used in sport. [3]

6. (a) Define the term *personality*. [1]

(b) Explain the interactionist approach to personality. [3]

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Turn over

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Answers written on this page
will not be marked.

(Option B continued)

7.   (a)   Describe the inverted-U hypothesis in terms of arousal and performance.   [3]

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          (b)   Discuss the advantages of the Sport Competition Anxiety Test (SCAT).   [2]

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8.   Discuss psychological skills training (PST).   [3]

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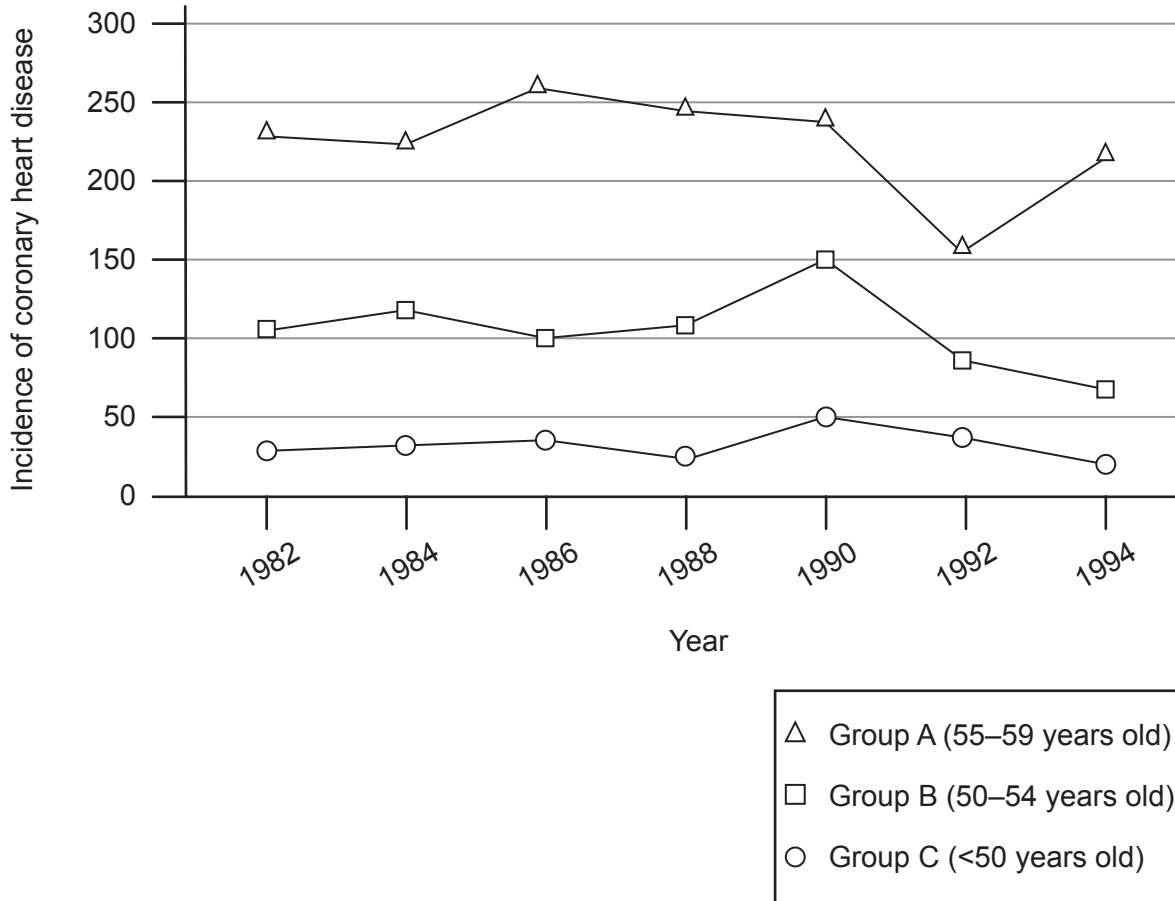
End of Option B

Option C — Physical activity and health

9. In 1982, a study of the incidence of coronary heart disease was conducted in nurses of three different age groups. This was repeated every two years until 1994. The results are shown below.

[Source: From: *New England Journal of Medicine*, Frank B. Hu, Meir J. Stampfer, JoAnn E. Manson, Francine Grodstein, Graham A. Colditz, Frank E. Speizer and Walter C. Willett, 'Trends in the Incidence of Coronary Heart Disease and Changes in Diet and Lifestyle in Women'. 343: 530, Copyright © (2000) Massachusetts Medical Society. Reprinted with permission from Massachusetts Medical Society.]

(Option C continues on the following page)

(Option C, question 9 continued)

(a) State the year with the highest incidence of coronary heart disease for Group A. [1]

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....

(b) Calculate the difference in the incidence of coronary heart disease between Group B and Group C in 1990. [2]

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(c) Compare and contrast the trend in coronary heart disease from 1990 to 1994 for the three groups. [2]

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(d) Outline what is meant by the term atherosclerosis. [3]

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(Option C continues on the following page)

(Option C continued)

10. (a) Define *hypokinetic disease*. [1]

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(b) Explain the relationship between major societal changes and hypokinetic disease. [3]

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11. An athlete in training finds they are losing weight. Discuss this in relation to the concept of energy balance. [2]

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> ....

(Option C continues on the following page)

(Option C continued)

12. (a) Outline **three** physical activity guidelines for the promotion of good health in adults. [3]

(b) Explain the major risk factors for type 2 diabetes. [3]

End of Option C

Option D — Nutrition for sport, exercise and health

13. A study was conducted with two groups of elite gymnasts to consider the effect of low carbohydrate (A) and high carbohydrate (B) diets. The mean body weight and body fat were measured before and after 30 days of identical training for both groups. The results are shown in the following diagram.
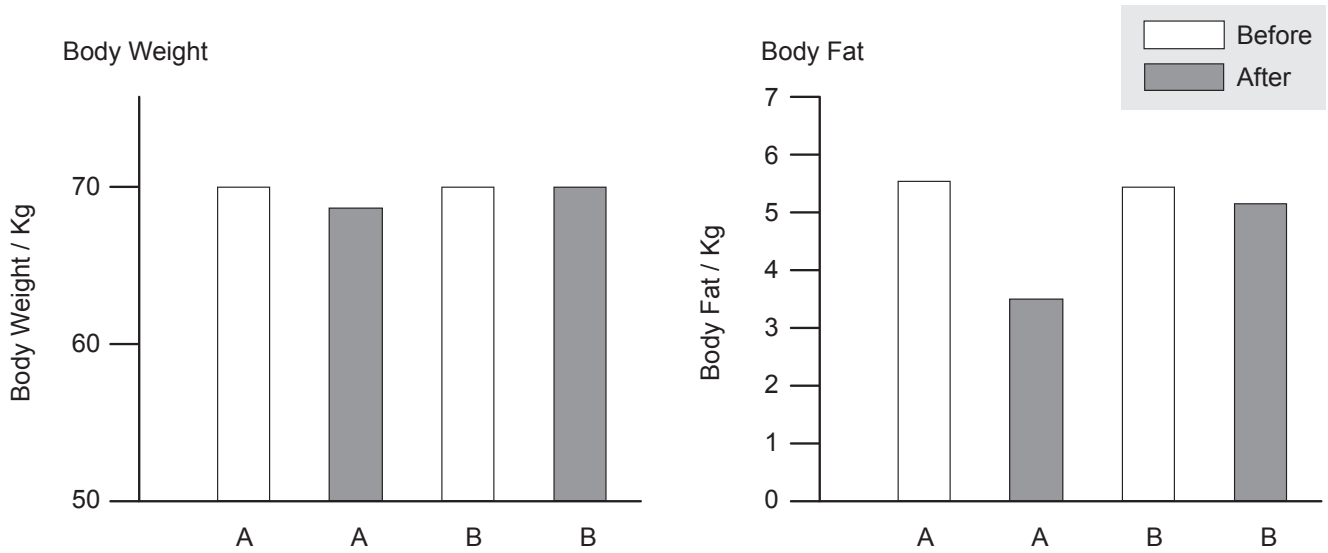
(a) Identify which diet results in the greatest loss of

(i) body fat. [1]

....

(ii) body weight. [1]

....

(Option D continues on the following page)

(Option D, question 13 continued)

(b) Calculate the difference in body fat between low carbohydrate and high carbohydrate diets after training. [2]

(c) Compare and contrast changes in body weight before and after training. [2]

(d) Outline the association between body composition and athletic performance in an endurance athlete. [2]

14. (a) State the typical pH range found in the

(i) mouth. [1]

(ii) small intestine. [1]

(Option D continues on the following page)

Turn over

(Option D, question 14 continued)

(b)   Discuss the role of enzymes in digestion. [4]

15.   (a)   Describe the use of creatine as a ergogenic aid in sport. [2]

(b)   Explain water distribution in trained and untrained individuals. [4]

End of Option D