Diploma Programme
Programme du diplôme
Programa del Diploma

Sports, exercise and health science
Standard level
Paper 3

Wednesday 9 November 2016 (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.
- 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 – 6
Option C — Physical activity and health	7 – 9
Option D — Nutrition for sport, exercise and health	10 – 11

8816 – 6603

Option A — Optimizing physiological performance

1. A study investigated the effects of sprint and plyometric training on an athlete's performance in the standing broad jump and 20m sprint tests. Participants were randomly assigned to three groups for a 10-week training program:

- Group A: plyometric group
- Group B: sprint group
- Group C: control group.

The figures below show the mean distance and 20m sprint time pre-training and post-training.

Removed for copyright reasons

(Option A continues on the following page)

(Option A, question 1 continued)

(a) State the group with the greatest improvement in the standing broad jump. [1]

. . . . . .
. . . . . .

(b) Identify the group with the fastest pre-training time for the 20m sprint. [1]

. . . . . .
. . . . . .

(c) Outline plyometrics as a training method used by long jumpers to increase speed and power. [2]

. . . . . .
. . . . . .
. . . . . .
. . . . . .

(Option A continues on the following page)

(Option A continued)

2. (a) Describe **two** steps an athlete can take to prevent heat-related disorders in a marathon in a hot climate. [2]

1. . . . . .
. . . . . .
2. . . . . .
. . . . . .

(b) (i) Describe how the body maintains core temperature when mountain walking in a cold environment. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(ii) Explain the relationship between the body surface area-to-body mass ratio and heat preservation in a mountain walker. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(Option A continues on the following page)

(Option A continued)

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

. . . . . .
. . . . . .

(b) Discuss the benefits for an athlete using anabolic steroids. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(c) Suggest how a soccer player could use periodization to optimise their performance in the preparation phase for the 2018 soccer world cup in Russia. [4]

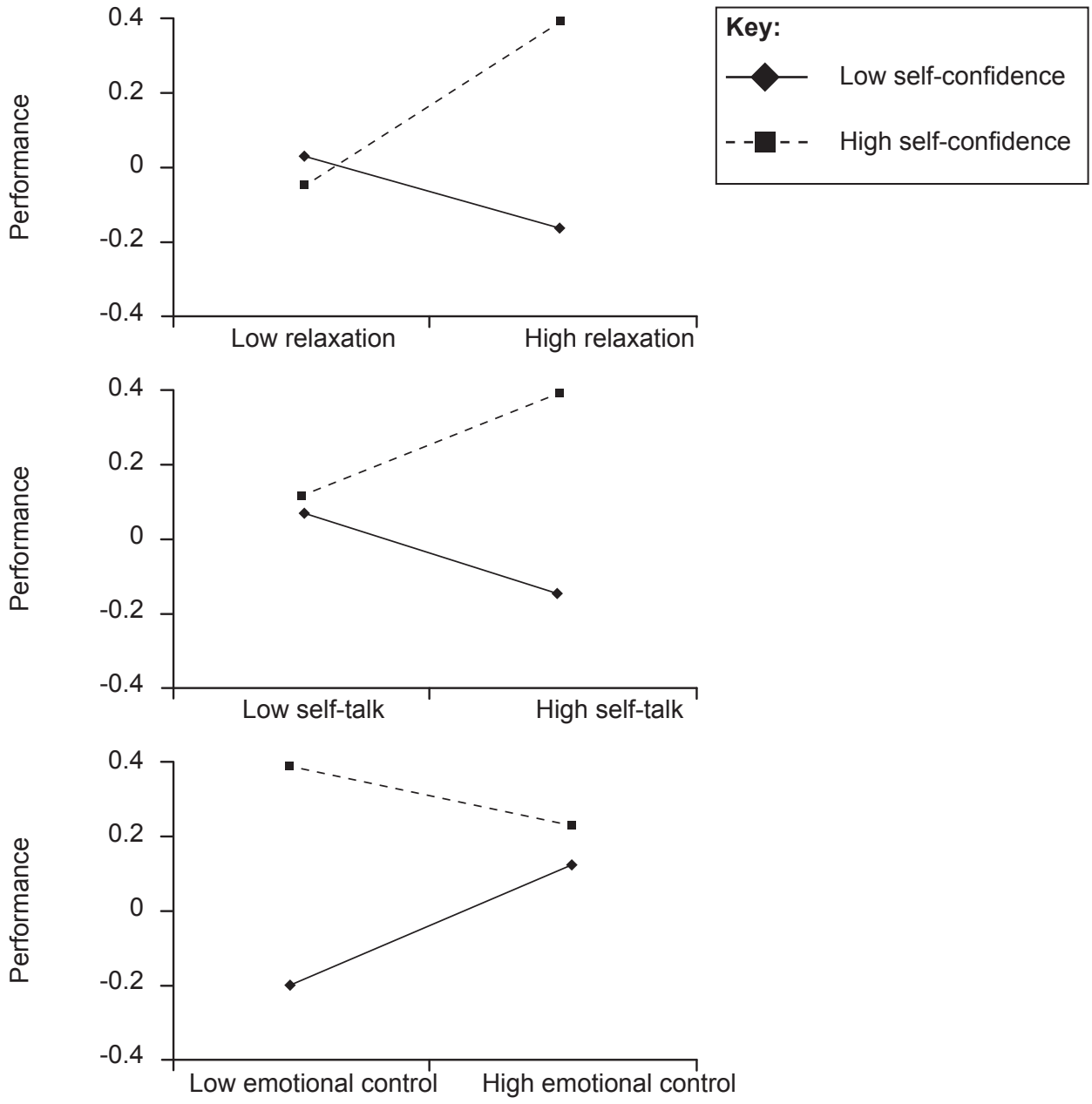
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

End of Option A

Option B — Psychology of sport

4. A study explored the relationship between three psychological skills training (PST) methods (relaxation, self-talk, emotional control) and the self-confidence of slalom skiers.

Performance refers to the difference between training and competition scores.
Higher positive scores demonstrate better performance in competition.



[Source: Copyright (2013) from "Psychological Skills Do Not Always Help Performance: The Moderating Role of Narcissism" by Ross Roberts et al. Reproduced by permission of the Association for Applied Sport Psychology (http://www.appliedsportpsych.org)]

(Option B continues on the following page)

(Option B, question 4 continued)

(a) State **one** type of PST method which results in the high self-confidence group improving their performance. [1]

. . . . . .
. . . . . .

(b) Identify the effect of high emotional control on performers with low self-confidence. [1]

. . . . . .
. . . . . .

(c) Outline the technique of "thought stopping" to reduce negative thoughts in slalom skiing. [2]

. . . . . .
. . . . . .
. . . . . .
. . . . . .

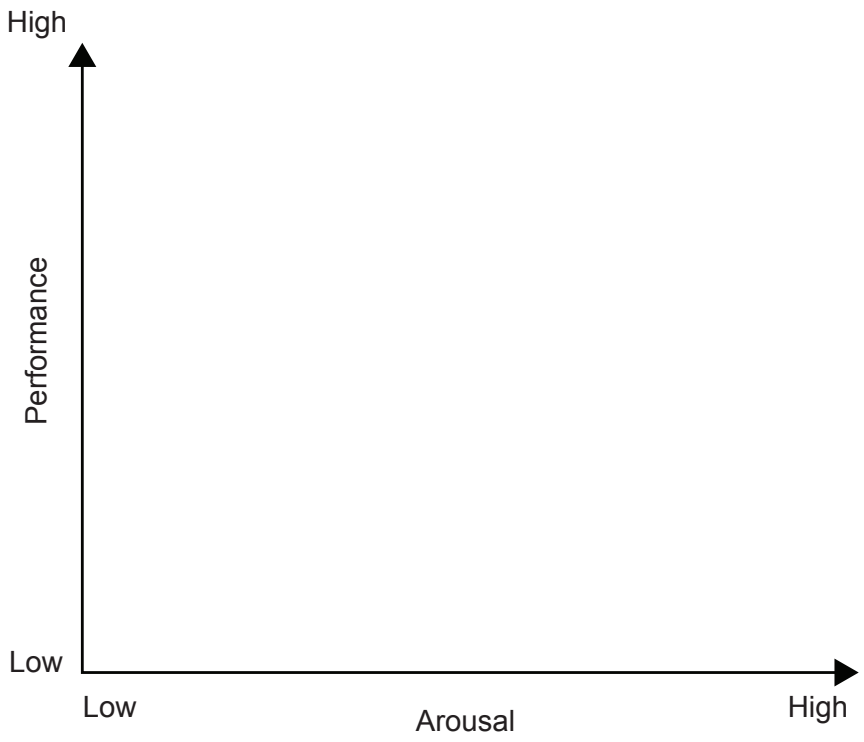
(d) Evaluate the use of mental imagery by a slalom skier. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(Option B continues on the following page)

(Option B continued)

5. (a) Draw a graphical representation of the drive reduction theory. [1]



(b) Describe Atkinson's model of Achievement Motivation. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(c) Outline how a golfer who is feeling stressed about an upcoming championship may feel physically. [2]

. . . . . .
. . . . . .
. . . . . .
. . . . . .

(Option B continues on the following page)

(Option B continued)

6. (a) Discuss how social learning theory can help a sports coach promote physical activity in children. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(b) Explain the issues in personality research and sports performance of athletes and non-athletes. [4]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

End of Option B

Option C — Physical activity and health

7. The table below shows the percentage of children who participate in at least one hour of moderate to vigorous physical activity per day in 2005/06 and 2009/10 in Europe.

Country	2005/06		2009/10	
	11-year-olds / %	15-year-olds / %	11-year-olds / %	15-year-olds / %
Denmark	31	20	16	14
England	27	18	33	25
France	24	14	21	14
Germany	25	16	25	13
Ireland	51	27	43	28
Netherlands	30	18	24	19
Poland	24	21	31	23
Portugal	30	15	23	14
Slovakia	51	46	30	27
Sweden	23	11	19	13

[Source: adapted from Nichols M, Townsend N, Luengo-Fernandez R, Leal J, Gray A, Scarborough P, Rayner M, (2012), *European Cardiovascular Disease Statistics 2012*. European Heart Network, Brussels, European Society of Cardiology, Sophia Antipolis.]

(a) State the country which has the highest percentage of 11-year-old children who participate in physical activity in 2009/10. [1]

. . . . . .

. . . . . .

(b) Calculate the change in the percentage of 15-year-old children who participate in physical activity in Slovakia, between 2005/06 and 2009/10. [2]

. . . . . .

. . . . . .

. . . . . .

. . . . . .

(Option C continues on the following page)

(Option C, question 7 continued)

(c) (i) Define the term *hypokinetic disease*. [1]

. . . . . .
. . . . . .

(ii) Discuss how studies of different populations provide evidence of the link between physical activity and hypokinetic disease. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(d) Outline the major health consequences for someone who is obese. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(Option C continues on the following page)

(Option C continued)

8. (a) Outline how bone density changes as an individual gets older. [1]

. . . . . .
. . . . . .

(b) Discuss **three** major risk factors for osteoporosis. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(Option C continues on the following page)

(Option C continued)

9. (a) Analyse type 1 diabetes and type 2 diabetes. [4]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(b) State **two** different approaches used to enhance adherence to exercise. [2]

. . . . . .
. . . . . .
. . . . . .
. . . . . .

End of Option C

Option D — Nutrition for sport, exercise and health

10. A study investigated the effect of two types of drinks on physical performance of a team in the Loughborough Soccer Passing Test, which includes measuring movement time and total time in seconds. The team is split into two groups. Each group is given a different drink.

- Group 1: carbohydrate free drink
- Group 2: drink with carbohydrate.

The table below shows the mean (± standard deviation) scores for the two groups and a baseline group.

	Baseline Group	**Group 1**	**Group 2**
Movement time / s	61.4 (± 7.3)	58.7 (± 5.6)	53.6 (± 5.9)
Total performance time / s	85.8 (± 9.6)	81.0 (± 7.1)	71.6 (± 7.5)

[Source: adapted from John O'Reilly, Stephen H. Wong, Effect of a carbohydrate drink on soccer skill performance following a sport-specific training program. *Journal of Exercise Science & Fitness,* 11 (2013) 95–101]

(a) State the standard deviation for movement time in the baseline test. [1]

. . . . . .

. . . . . .

(b) Identify the mean total performance time for Group 2. [1]

. . . . . .

. . . . . .

(c) Describe **two** techniques used by athletes to monitor hydration status. [2]

. . . . . .

. . . . . .

. . . . . .

. . . . . .

(Option D continues on the following page)

(Option D, question 10 continued)

(d) (i) Discuss water distribution in trained athletes. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(ii) Explain the roles of the medulla and the loop of Henlé in maintaining the water balance of the blood. [4]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(Option D continues on the following page)

(Option D continued)

11. (a) List **two** sources of protein, one for a vegetarian and one for a non-vegetarian diet. [2]

1. Vegetarian diet . . . . . .
2. Non-vegetarian diet. . . . . .

(b) State one enzyme responsible for the digestion of protein from the mouth to the small intestine. [1]

. . . . . .
. . . . . .
. . . . . .
. . . . . .

(c) Describe the possible harmful effects of excessive protein intake on an Olympic weightlifter. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

(d) Explain the benefits of the use of creatine as a nutritional ergogenic aid in sport. [3]

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

End of Option D