Sports, exercise and health science
Standard level
Paper 2

Thursday 10 May 2018 (afternoon)

Candidate session number

1 hour 15 minutes

Instructions to candidates

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all questions.
- Section B: answer one question.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[50 marks]**.

18 pages

2218 – 6605

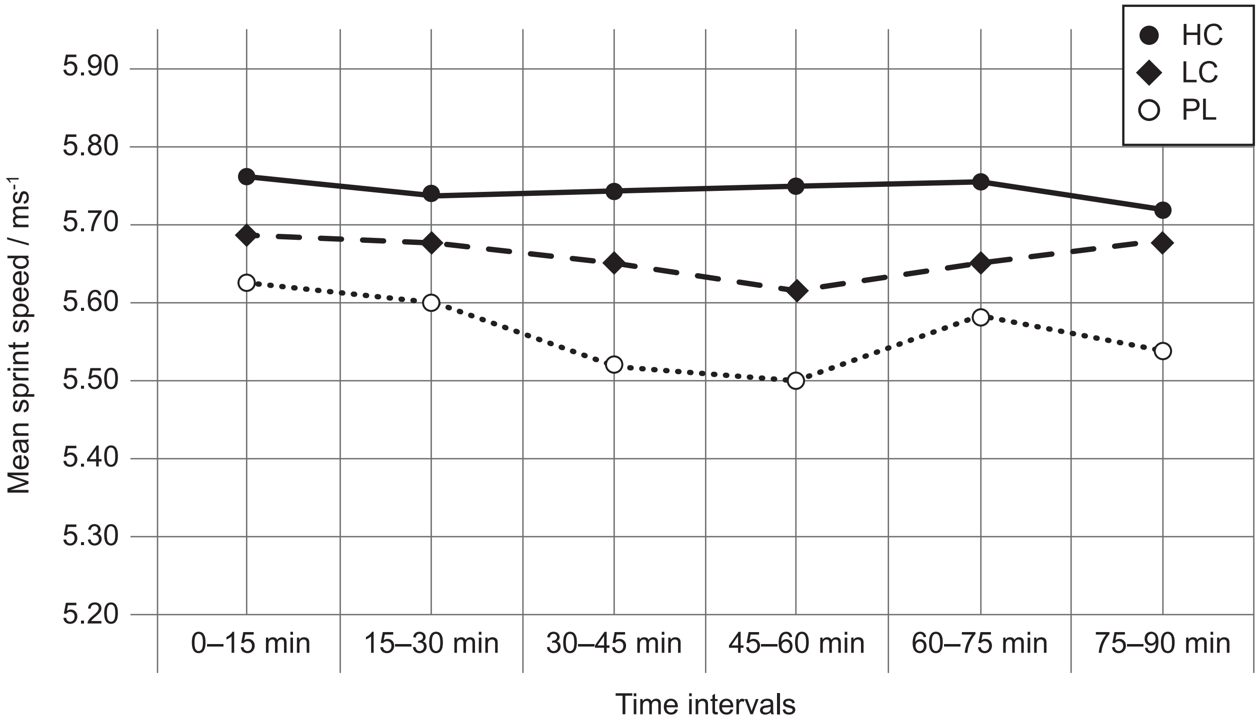
Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

1. A study investigated the effect of three different pre-exercise drinks on sprint speed of football players during a match. Trials were completed in a randomized, double-blind fashion. Participants consumed the following drinks:

- Condition 1: High carbohydrate drink (HC)
- Condition 2: Low carbohydrate drink (LC)
- Condition 3: Placebo (PL).

The graph shows the mean sprint speed at six different time intervals.



[Source: Adapted from *Journal of Science and Medicine in Sport*, 17, M Kingsley *et al.*, Effects of carbohydrate-hydration strategies on glucose metabolism, sprint performance and hydration during a soccer match simulation in recreational players, copyright 2013, pp. 239–243, with permission from Elsevier.]

(a) (i) Identify the time interval which has the greatest difference in mean sprint speed between conditions 1 and 3. [1]

. . . .

. . . .

(This question continues on the following page)

(Question 1 continued)

(ii) Calculate the difference between mean sprint speeds for conditions 1 and 3 during the time interval identified in 1(a)(i). [2]

. . . .

. . . .

. . . .

. . . .

(iii) Using the data, discuss the hypothesis that the consumption of a high carbohydrate drink improves sprinting performance. [2]

. . . .

. . . .

. . . .

. . . .

. . . .

. . . .

(b) Explain how the double-blind experimental procedure was used in this study. [2]

. . . .

. . . .

. . . .

. . . .

. . . .

. . . .

(This question continues on the following page)

Turn over

(Question 1 continued)

(c) Compare and contrast the fuel sources used by the lactic acid and aerobic energy systems. [3]

The table shows the results from an investigation comparing the mean heart rate of 30-year-old individuals at rest and during a VO_2 max test on a treadmill. There were three groups:

- Group 1: Marathon runners
- Group 2: Recreational runners
- Group 3: Sedentary individuals.

	Time of test	**Group 1**	**Group 2**	**Group 3**
Mean heart rate / beats min^{-1}	At rest	48	55	68
	At 6 minutes	119	132	153
	At 12 minutes	170	178	180

(d) Calculate the difference between the mean heart rate at rest of groups 1 and 3. [2]

(This question continues on the following page)

(Question 1 continued)

(e) Explain possible reasons for differences in the mean heart rate of the marathon runners with the other groups. [3]

. . . .

. . . .

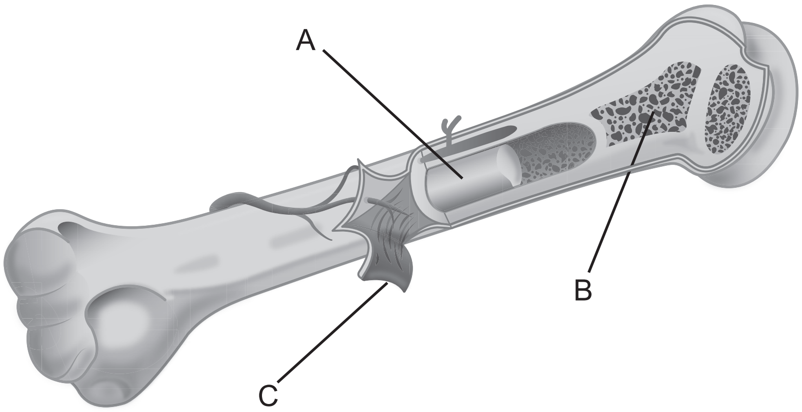
. . . .

. . . .

. . . .

. . . .

2. The diagram shows the humerus.



[Source: Reprinted from *Lancet Diabetes Endocrinol.*, 2014 May, 2, no. 5, Vervloet *et al.*, Bone: a new endocrine organ at the heart of chronic kidney disease and mineral and bone disorders, pp. 427-36. doi: 10.1016/S2213-8587(14)70059-2, with permission from Elsevier.]

(a) Label the structures A, B and C. [3]

A. . . . .

B. . . . .

C. . . . .

(b) State the location of the humerus in relation to the radius using anatomical terminology. [1]

. . . .

. . . .

(c) Identify the class of lever that is working at the elbow joint when the biceps is contracting. [1]

. . . .

. . . .

3. (a) Outline the following components of fitness:

(i) flexibilty [1]

. . . .

. . . .

(ii) reaction time [1]

. . . .

. . . .

4. (a) (i) Define *standard deviation*. [1]

. . . .

. . . .

(ii) Discuss how standard deviation can be used to interpret data. [2]

. . . .

. . . .

. . . .

. . . .

5. (a) Distinguish between the short-term memory and long-term memory in terms of capacity and duration. [2]

. . . .

. . . .

. . . .

. . . .

(b) Using an example, explain how selective attention and previous experience influence an athlete's performance. [3]

. . . .

. . . .

. . . .

. . . .

. . . .

. . . .

Section B

Answer **one** question. Answers must be written within the answer boxes provided.

6. (a) Describe **five** features of a synovial joint. [5]

(b) Discuss the process of gaseous exchange at the alveoli during exercise. [4]

(c) Outline the concept of angular momentum occurring in the legs of an athlete sprinting on a track. [5]

(d) Analyse the contraction of skeletal muscle after the release of calcium ions from the sarcoplasmic reticulum. [6]

7. (a) Using examples, describe reliability and validity in fitness tests. [4]

(b) Evaluate sub-maximal fitness tests. [4]

(c) Describe the intrinsic and extrinsic regulation of the heart. [6]

(d) Discuss expected changes to systolic and diastolic blood pressure between rest and during prolonged cycling. [6]

8. (a) Distinguish between saturated and unsaturated fatty acids. [4]

(b) Discuss the contributions of the anaerobic energy systems during a training run. [6]

(c) Describe how feedback is used in Welford’s model of information processing to affect performance. [6]

(d) Explain how a football player quickly stepping one way then another is using the psychological refractory period (PRP) to gain advantage over a defender. [4]

Turn over

Please **do not** write on this page.

Answers written on this page
will not be marked.

Please **do not** write on this page.

Answers written on this page
will not be marked.