

2013 PHYSICAL EDUCATION

**FOR OFFICE
USE ONLY**

SUPERVISOR
CHECK

--

RE-MARKED

--

**ATTACH SACE REGISTRATION NUMBER LABEL
TO THIS BOX**

**QUESTION
BOOKLET**

1

15 pages, 5 questions

Wednesday 6 November: 9 a.m.

Time: 2 hours

Section A of Part 1

Examination material: Question Booklet 1 (15 pages)
Question Booklet 2 (14 pages)
one SACE registration number label

Approved dictionaries and calculators may be used.

Instructions to Students

- You will have 10 minutes to read the paper. You must not write in your question booklets or use a calculator during this reading time but you may make notes on the scribbling paper provided.
- This paper is in two parts: Section A of Part 1 is in Question Booklet 1; Section B of Part 1 and Part 2 are in Question Booklet 2.

Part 1: Short-answer Questions (Questions 1 to 10)
Answer Section A of Part 1 (Questions 1 to 5) in the spaces provided in Question Booklet 1.
You may write on page 15 of Question Booklet 1 if you need more space.
Answer Section B of Part 1 (Questions 6 to 10) in the spaces provided in Question Booklet 2.
You may write on page 14 of Question Booklet 2 if you need more space.

Part 2: Extended-response Question (Question 11)
Answer Part 2 in the space provided in Question Booklet 2.
You may write on page 14 of Question Booklet 2 if you need more space.
- There is no need to fill all the space provided; clear, well-expressed answers are required.
- The allocation of marks is as follows:

Part 1	110 marks
Part 2	10 marks
Total	120 marks
- Attach your SACE registration number label to the box at the top of this page. Copy the information from your SACE registration number label into the boxes on the front cover of Question Booklet 2.
- At the end of the examination, place Question Booklet 2 inside the back cover of this question booklet.

**STUDENT'S DECLARATION ON THE USE OF
CALCULATORS**

By signing the examination attendance roll I declare that:

- my calculators have been cleared of all memory
- no external storage media are in use on these calculators.

I understand that if I do not comply with the above conditions for the use of calculators I will:

- be in breach of the rules
- have my results for the examination cancelled or amended
- be liable to such further penalty, whether by exclusion from future examinations or otherwise, as the SACE Board of South Australia determines.

The examination questions begin on page 4.

PART 1: SHORT-ANSWER QUESTIONS (Questions 1 to 10)

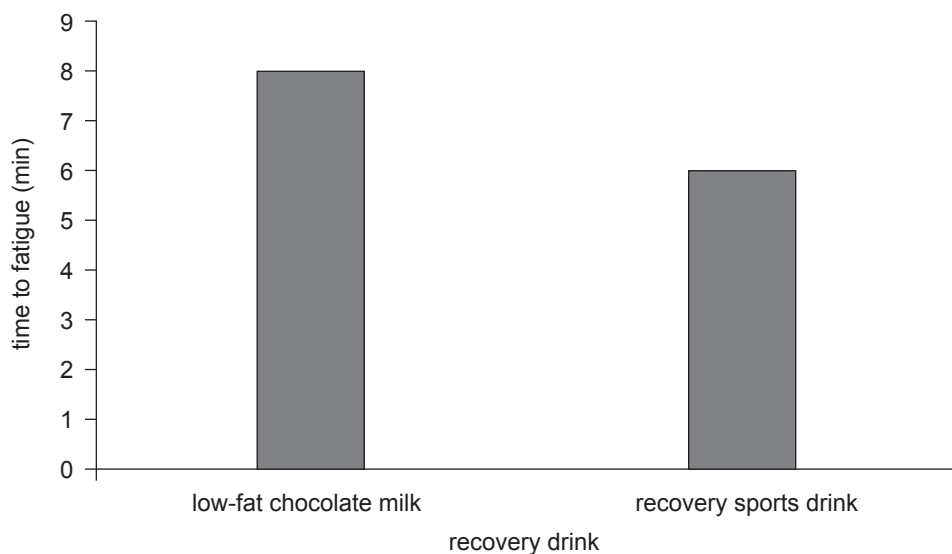
(110 marks)

Answer **all** questions in this part in the spaces provided. Credit will be given for clear, accurate answers and the correct use of terminology. The allocation of marks is shown in brackets at the end of each part of each question.

Section A (Questions 1 to 5)

(60 marks)

1. Teams in hockey championships must play 90-minute games on consecutive days. Coaches expect high-intensity performances from their players in each game. The following graph shows the effect of recovery drinks on the players' time to fatigue:



- (a) With reference to the graph above, identify and explain which drink is more effective in delaying fatigue.

(2 marks)

- (b) Refer to the following table, which shows the nutrient content of the low-fat chocolate milk and the recovery sports drink:

<i>Nutrient</i>	<i>Low-fat Chocolate Milk (250 mL)</i>	<i>Recovery Sports Drink (250 mL)</i>
energy (kJ)	500	328
protein (g)	9.5	0
fat (g)	2.4	0
carbohydrate (g)	27	14
sugars (g)	14.3	15
sodium (mg)	150	70
potassium (mg)	5	95
calcium (mg)	300	0

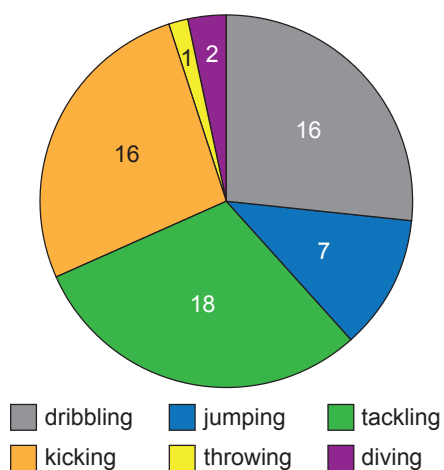
- (i) Explain *one* advantage of the combination of carbohydrate and protein in a recovery drink.

[illegible]

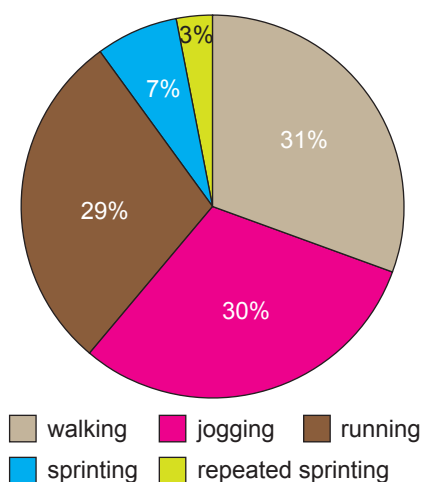
- (ii) With reference to the table above, explain *one* disadvantage of low-fat chocolate milk as a recovery drink.

(2 marks)

2. The number of skills and the movements (percentages) of a midfield player were recorded during an elite soccer match in the women's national league, as shown in the graphs below:



Graph 1: Skill Analysis



Graph 2: Movement Analysis

- (a) Identify the skill most commonly performed by this player during the match.

_____ (1 mark)

- (b) Explain the importance for this player's recovery of walking and jogging between periods of sprinting.

(2 marks)

- (c) Identify and explain the fuel sources that contributed to the energy of the player in the periods of walking during the match.

(3 marks)

- [illegible]

- (i) Fitness factor: _____
Fitness test: _____ (1 mark)
- (ii) Fitness factor: _____
Fitness test: _____ (1 mark)

- Explain the likely effect of this change on the accuracy of the player when performing kicking and dribbling skills.

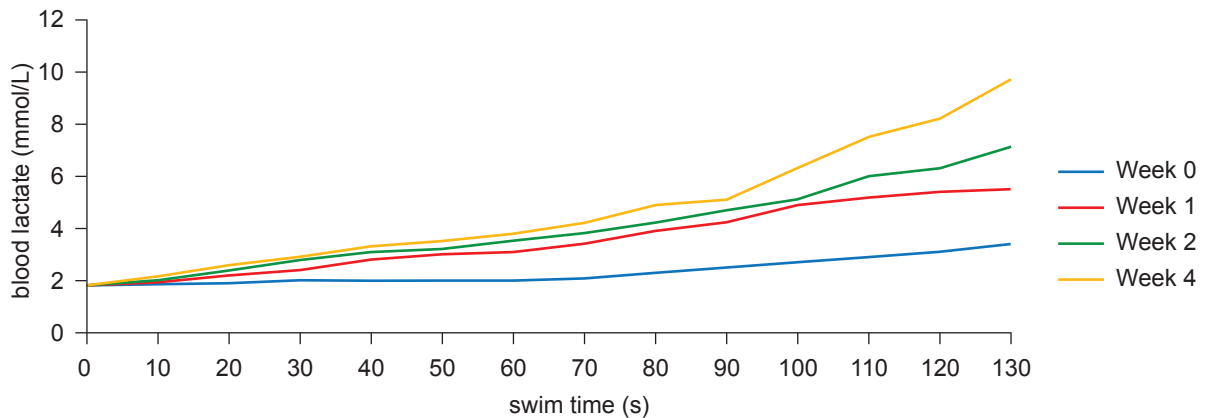
[illegible]

3. A competitive swimmer was required to swim a 200 metre constant-paced freestyle in 130 seconds.

The swim was repeated four times, starting at the end of the 5-month competitive season:

- Week 0 — at end of competitive season
- Week 1 — after 1 week without training
- Week 2 — after 2 weeks without training
- Week 4 — after 4 weeks without training.

Refer to the following graph, which shows the swimmer's blood lactate measurements recorded during the 130 seconds of each swim:



- (a) With reference to the graph above, explain *one* relationship between weeks without training and the blood lactate measurements recorded during each 200 metre swim.

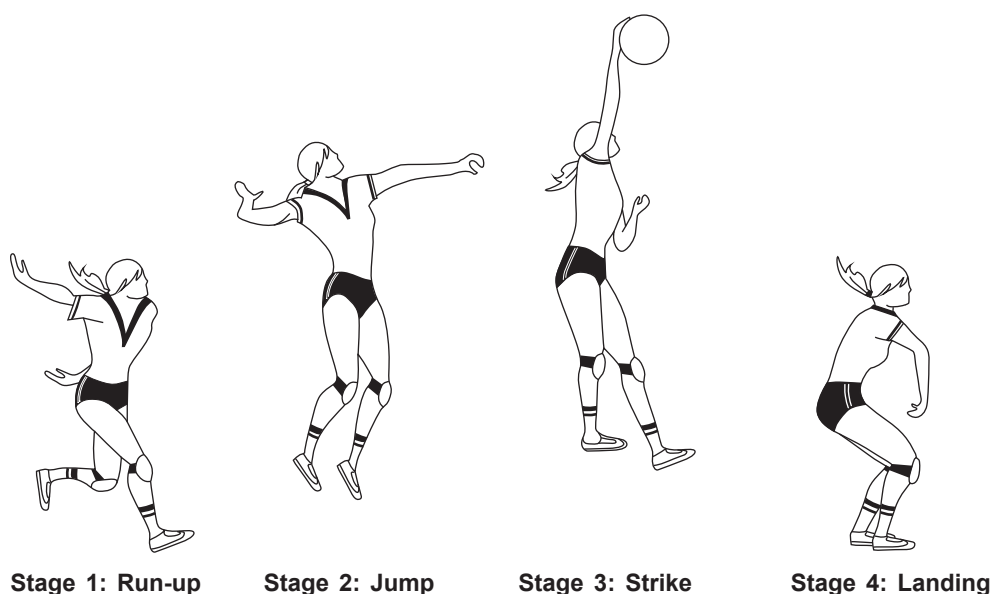
(3 marks)

- Explain how the swimmer, starting at the end of the competitive season, was able to swim a 200 metre constant-paced freestyle in 130 seconds all four times, despite the increasing number of weeks without training.

[illegible]

-
-
-
-
-
-
- (2 marks)

4. Refer to the following diagram, which shows the four stages of a volleyball spike requiring a maximum effort:



- (a) Explain which is the most beneficial type of muscle fibre used in the legs when a player is completing the volleyball spike.

(2 marks)

- (b) Explain *one* biomechanical principle that allows the player to successfully complete *one* of the first three stages of the volleyball spike.

(2 marks)

- (c) Explain *one other* biomechanical principle that allows the player to remain balanced when landing (Stage 4).

(2 marks)

-
-
-
-
-
-

(ii) Explain *one* chronic muscular adaptation that the player would gain from these training methods to increase power.

www.theallpapers.com

5. The heart-rate of a 20-year-old cyclist was monitored as she exercised on a stationary cycle ergometer, as shown in the illustration below:



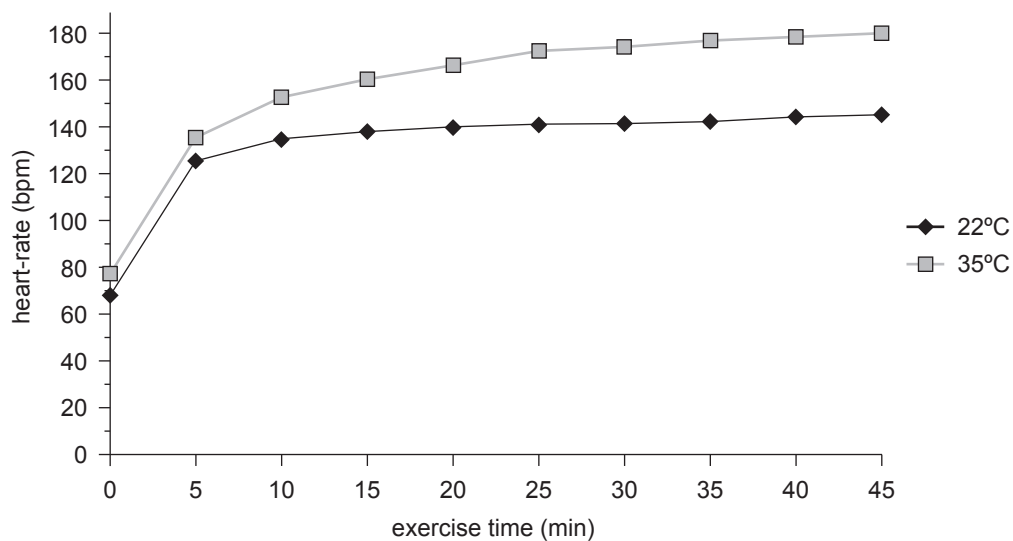
Source: © Davidrey/Dreamstime.com

The cyclist completed two 45-minute trials, on separate days and at different temperatures:

- Trial 1 — at 22°C
- Trial 2 — at 35°C.

The cycle ergometer was set at the same workload for each trial and the cyclist consumed no fluids during either trial.

Refer to the following graph, which shows the cyclist's heart-rate response to 45 minutes of exercise at different temperatures:



- (a) With reference to the graph above, identify the cyclist's heart-rate response to exercise at 22°C and at 35°C at the 25-minute mark.

(2 marks)

- (b) Explain how the heart-rate response to exercise at higher temperatures may affect an athlete's performance.

(4 marks)

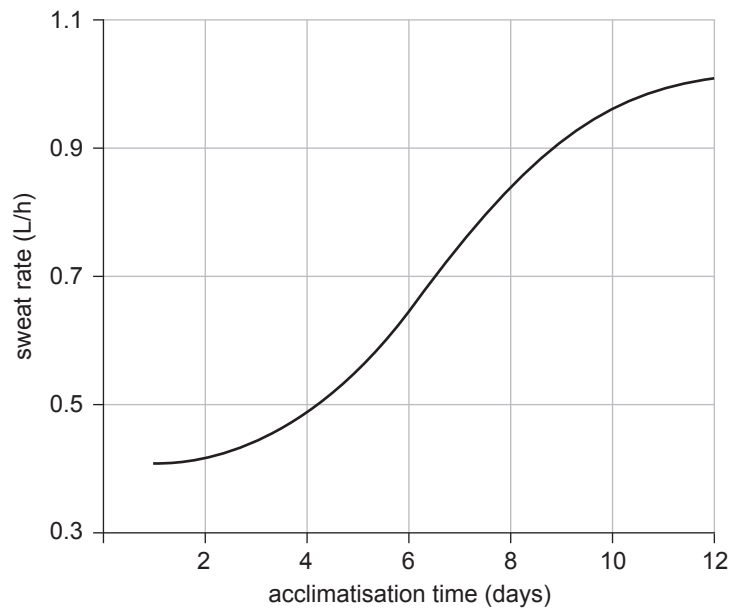
- (c) *During each trial the cyclist's weight was recorded before exercise, after exercise, and at recovery (2 hours after exercise), as shown in the table below:*

	<i>Before Exercise (kg)</i>	<i>After Exercise (kg)</i>	<i>Recovery (kg)</i>
Trial 1 (22°C)	74.0	73.5	74.0
Trial 2 (35°C)	74.0	72.0	74.0

Explain the likely cause of the cyclist's greater after-exercise change in weight in Trial 2.

(2 marks)

- (d) Refer to the following graph, which shows changes in the sweat rate per hour of trained athletes over 12 days of acclimatising to a hot environment:



- (i) With reference to the graph above, describe the relationship between acclimatisation time and sweat rate per hour.

(2 marks)

- (ii) With reference to sports performance in a hot environment, explain *one* advantage and *one* disadvantage of heat acclimatisation training.

Advantage: _____

Disadvantage: _____

(4 marks)

[illegible]

2013 PHYSICAL EDUCATION

**FOR OFFICE
USE ONLY**

SUPERVISOR
CHECK

RE-MARKED

SACE REGISTRATION NUMBER						
SEQ	FIGURES					CHECK LETTER
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
PHYSICAL EDUCATION						
					BIN	<input type="text"/>

**QUESTION
BOOKLET**

2

14 pages, 6 questions

Wednesday 6 November: 9 a.m.

Section B of Part 1, and Part 2

Write your answers to Section B of Part 1 and to Part 2 in this question booklet.

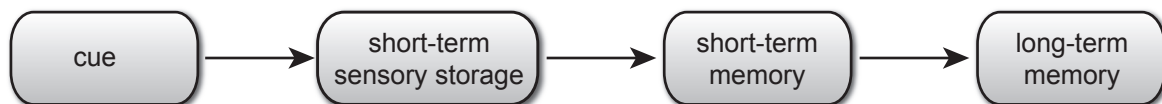
PART 1: SHORT-ANSWER QUESTIONS

Section B (Questions 6 to 10)

(50 marks)

Answer **all** questions in the spaces provided.

6. Refer to the following diagram, which shows stages in the processing of information, from identifying a cue through to storage in the long-term memory:



(a) Name a sport of your choice. _____

- (i) Identify *one* relevant cue for this sport.

_____ (1 mark)

- (ii) Explain how you could change the cue to increase the cognitive learner's ability to detect it.

_____ (2 marks)

- (b) Using a sporting example, explain the coaching technique of 'chunking', and how it helps in learning a new skill.

_____ (2 marks)

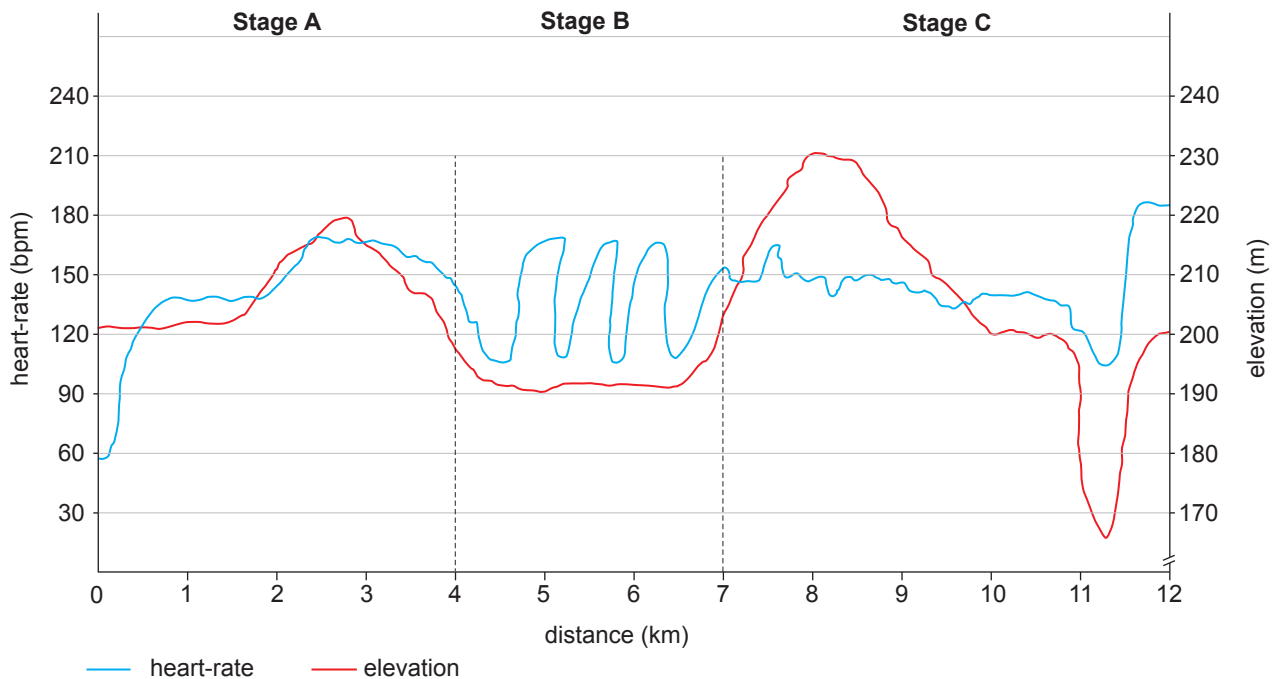
- (c) (i) Explain why an effective coach will 'open up' training drills in a practice session.

(2 marks)

- (ii) Explain the possible psychological effect that opening up a training drill too soon could have on a cognitive learner.

(2 marks)

7. A 30-year-old endurance athlete's training session run was recorded using a heart-rate device and global positioning system (GPS) tracking to measure changes in the terrain during the run, as shown in the graph below:



- (a) What was the athlete's maximum heart-rate during the run?

_____ (1 mark)

- (b) A person who is running may experience a 'steady' heart-rate.
Give the physiological reason for this.

_____ (2 marks)

- (c) Using data from the graph above, assess the likelihood that the athlete exceeded his lactate threshold.

_____ (2 marks)

- (d) During Stage B of the run the athlete completed three work efforts over the same distance.

Explain the importance of achieving the correct work-to-rest ratio when training the aerobic energy system.

(2 marks)

- (e) (i) Using data from the graph on page 4, explain the most likely cause of this athlete's fatigue when running the last kilometre.

(2 marks)

- (ii) Explain the effect that the athlete's effort in the last kilometre would have on EPOC.

(2 marks)

- (f) Explain the interplay of this athlete's energy systems in Stage B.

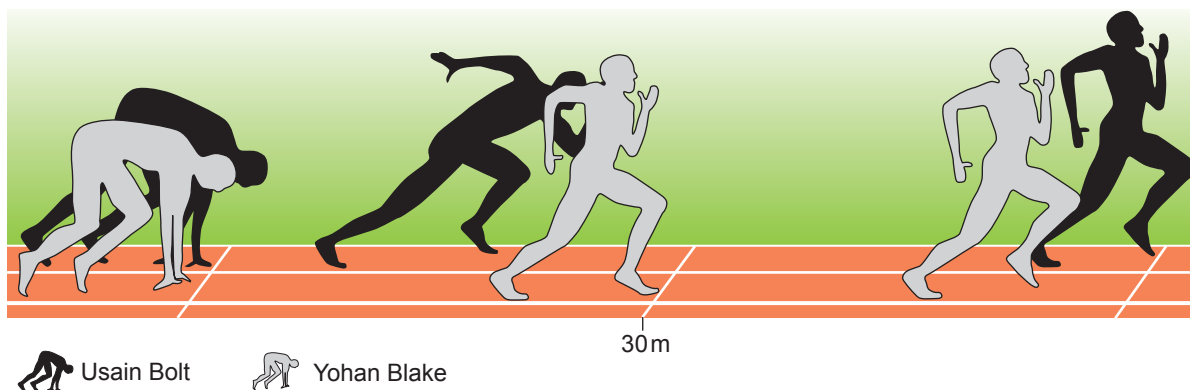
(4 marks)

- Explain which *one* of the zones would most improve the athlete's lactate threshold. Justify your answer.

[illegible]

8. Refer to the following table, which shows the height and weight of two Olympic runners, Usain Bolt and Yohan Blake, and their best 100 metre times; refer also to the illustration below, showing Bolt and Blake in running positions:

	Height (cm)	Weight (kg)	Best 100m Time (s)
Bolt	195.6	94.0	9.58
Blake	180.3	80.4	9.75



Source: Illustration adapted from www.telegraph.co.uk

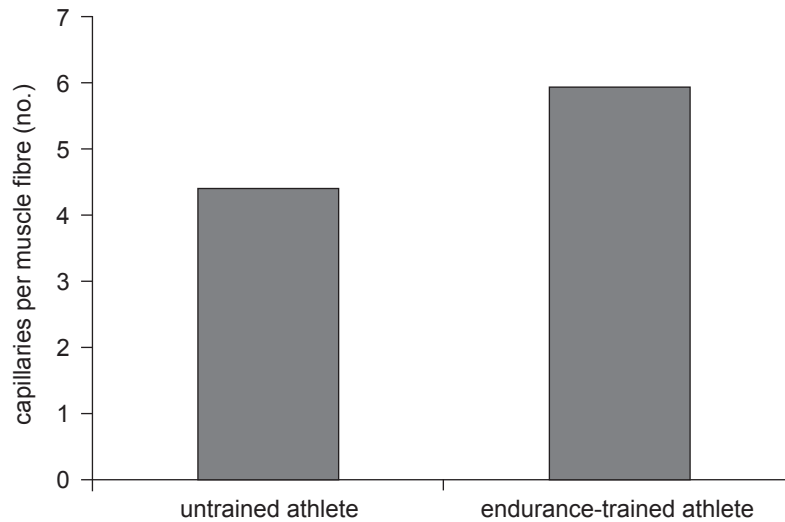
- (a) Give *one* biomechanical reason to explain why Blake is in front of Bolt at the 30 metre mark.

(2 marks)

- (b) Explain *one* biomechanical advantage that Bolt has over Blake because of his height.

(2 marks)

9. There are a number of chronic physiological adaptations that may improve the performance of an athlete with regular and long-term training. The graph below shows the number of capillaries per muscle fibre for an untrained athlete and an endurance-trained athlete:



- (a) Identify *one* method of training that would produce the chronic physiological adaptation shown in the graph above.

_____ (1 mark)

- (b) (i) State *one other* chronic physiological adaptation that may occur in the muscles as a result of a long-term endurance training program.

_____ (1 mark)

- (ii) Explain how this adaptation would improve an athlete's aerobic performance.

_____ (2 marks)

(c) Explain how the number of capillaries per muscle fibre would affect the endurance-trained athlete's:

(i) $a\text{-}\dot{V}O_2$ difference. _____

_____ (2 marks)

(ii) heart-rate during submaximal exercise. _____

_____ (2 marks)

(d) Explain how the endurance-trained athlete's $a\text{-}\dot{V}O_2$ difference or heart-rate during submaximal exercise would delay fatigue and improve the athlete's performance.

_____ (3 marks)

10. Hamish and Bailey have recently joined a social running group. Both men, running at the same speed, completed a training jog in the same time.

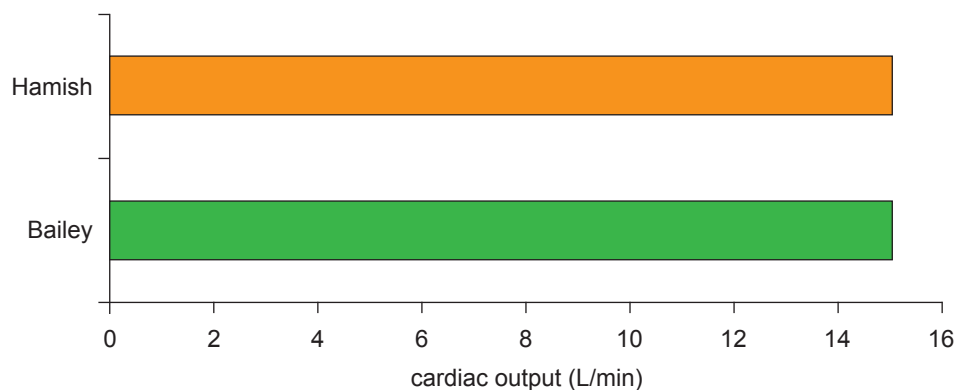
Refer to the following table, which shows the resting heart-rate, $\dot{V}O_2$ maximum values, and age of both men:

	Hamish	Bailey
resting heart-rate (bpm)	78	54
$\dot{V}O_2$ maximum (mL/kg/min)	40	55
age (years)	20	20

- (a) With reference to the table above, explain which one of the men has the greater aerobic fitness.

(2 marks)

Refer to the following graph, which shows the cardiac output values for the two men during this submaximal jog:



- (b) Outline the most likely reason that Hamish and Bailey have the same cardiac output values at submaximal intensity.

(2 marks)

(c) Explain the likely difference in cardiac output of the two men at maximal intensity.

(3 marks)

PART 2: EXTENDED-RESPONSE QUESTION (Question 11)

(10 marks)

Write your answer in the space below and on page 13.

11. *The image below shows the high-pressure play that marked the last few seconds of the 2013 grand final of the national netball championships.*

The speed of the game was fast, with the players closely defended, and a difference of one goal between the teams. Spectators cheered and coaches shouted as the excitement and tension increased.

This photograph cannot be reproduced here
for copyright reasons.

Source: Photograph by Mark Brake (adapted) © www.goldcoast.com.au

Using specific examples, explain how, in a sport of your choice, *three* of the following factors would affect successful performance in a high-pressure situation:

- selective attention
- signal detection
- feedback
- decision-making
- fatigue.

[illegible]

[illegible]

PHYSICAL EDUCATION 2013

ACKNOWLEDGMENT

Question 8, page 7: The diagram was adapted from www.telegraph.co.uk, © Telegraph Media Group Limited 2012.