NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2011

SPORT AND EXERCISE SCIENCE: PAPER I

Time: 2 hours 150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 6 pages and an Answer Booklet of 6 pages (i – vi). Please check that your question paper is complete. Detach the Answer Booklet from the middle of the question paper.

2. Answer all questions.

3. Questions 1 – 7 must be answered in the Answer Book. All other questions (8 – 11) must be answered in your Answer Booklet.

4. Read the questions carefully.

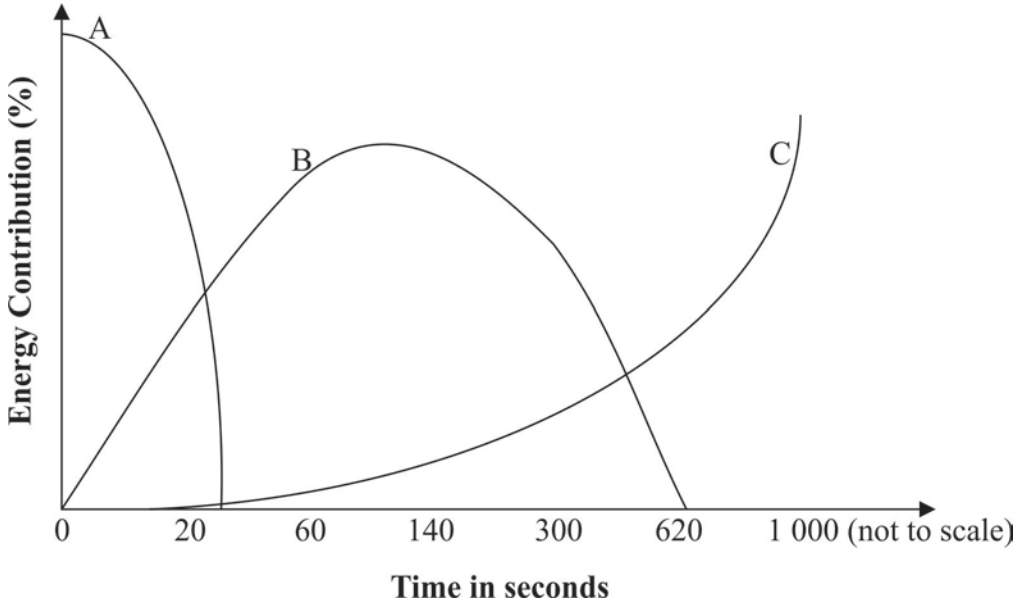
5. Number the answers exactly as the questions are numbered.

6. Use the total marks awarded for each question as an indication of the detail required.

7. It is in your own interest to write legibly and to present your work neatly.

QUESTION 1

The process of energy release for the demands of physical activity is derived from 3 different energy systems. One is **aerobic** and the other two are **anaerobic**.



1.1 Provide labels for the energy systems depicted as A, B and C in the graph above. (3)

1.2 Explain each of these energy systems and its influence on performance. Tabulate your response. (12)

1.3 Athletes participating in basketball will depend mostly on ONE of the systems illustrated above.

1.3.1 Select A, B or C from the graph. (1)

1.3.2 Identify which game circumstances, occurring in a typical basketball match would allow for the partial recovery of the system in question. (4)

1.3.3 What advantages would these opportunities (identified in Question 1.3.2 above) have on the performances of these athletes? (3)

[23]

QUESTION 2

'Champions are born and not made.'

Consider this statement and support or refute its validity in an essay-type response.

Your response should specifically include discussion on the relative contribution of:

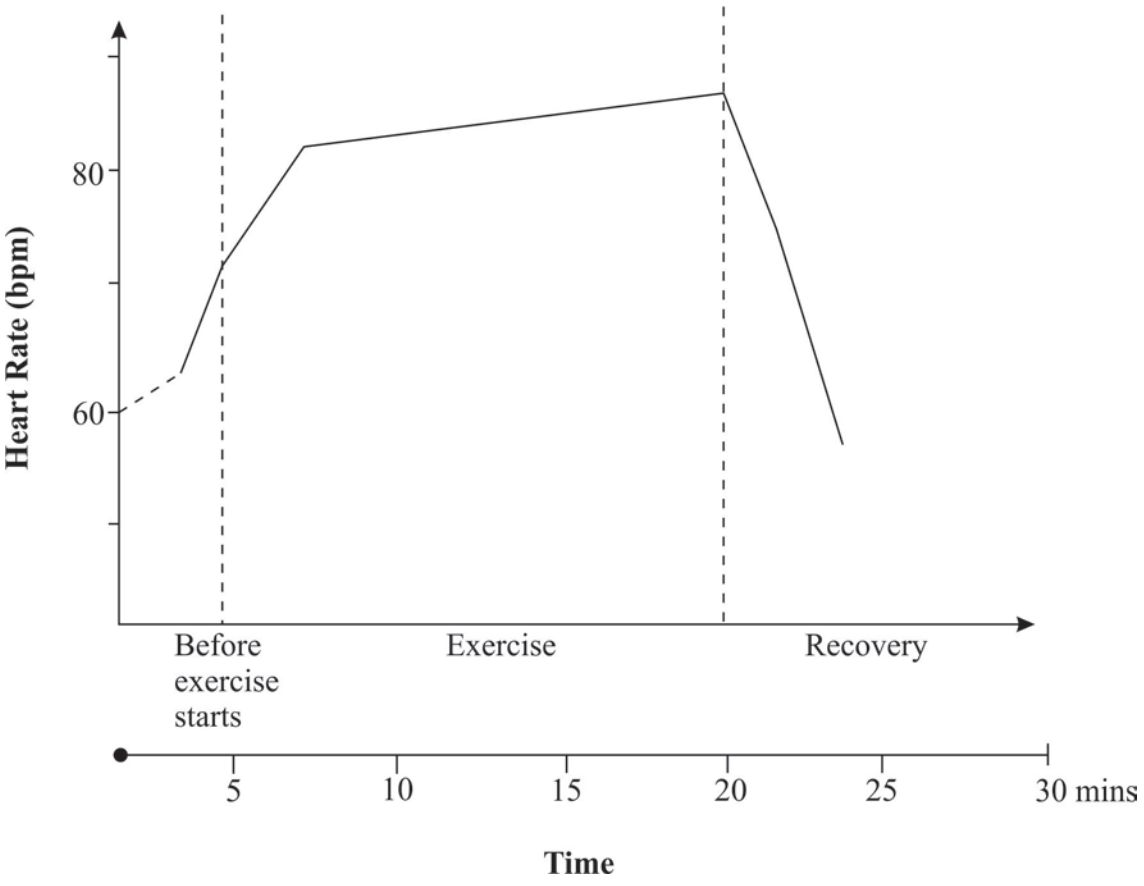
- Natural talent
- Environmental influences
- Mental state

and, where possible, use examples of elite athletes to motivate your point of view.

[15]

QUESTION 3

Below is a graph depicting an athlete's heart rate response to exercise.

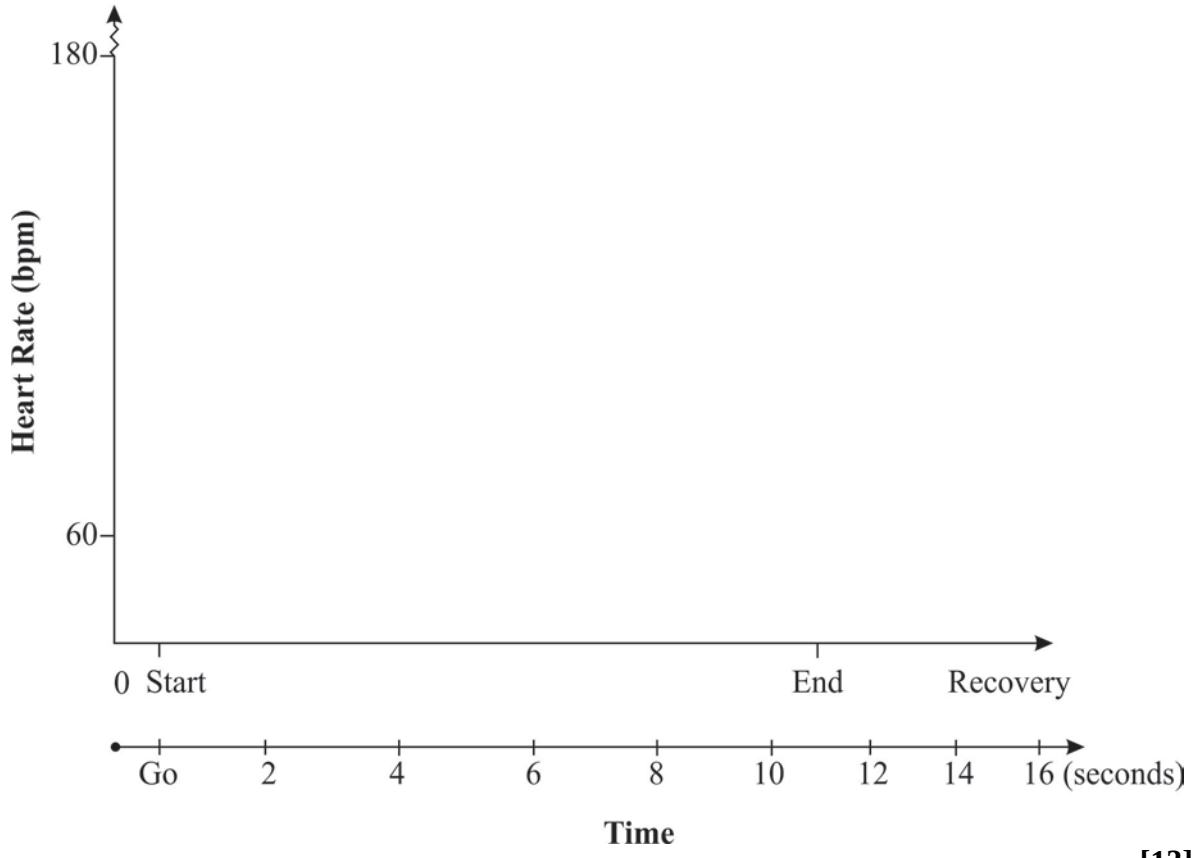


3.1 Interpret this graph. (3)

3.2 Is this athlete engaged in low intensity or high intensity activity during the 15 minute exercise session? (1)

3.3 Give reasons for your answer to Question 3.2. (4)

3.4 Draw a graph illustrating Heart Rate (bpm) over time (sec) for a 100 m track sprinter. (Use the given *x* and *y* parameters). (5)



[13]

QUESTION 4

Typically, scholar athletes who participate in Regional Sports Festivals are required to play several matches a day over at least 3 consecutive days.

What strategy should a coach apply to ensure that athletes recover effectively and maintain their high performance levels?

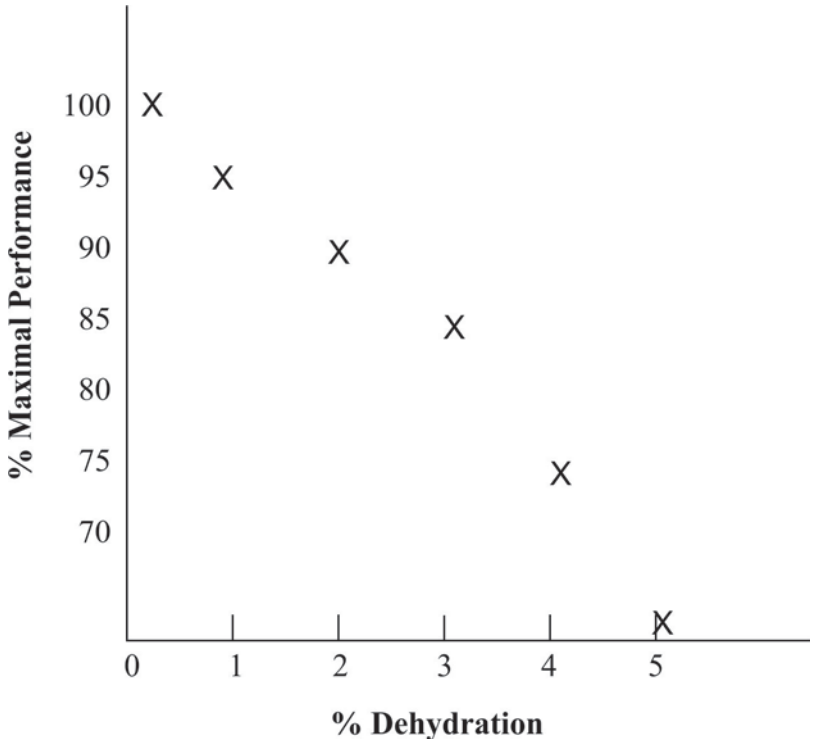
In your response consider the contribution these and other strategies have:

- Food and hydration
- Physical conditioning
- Post-game/match recovery strategies
- Pre-game/match preparations

[15]

QUESTION 5

It is well known that dehydration affects athletic performance negatively.



5.1 Interpret the graph above, discussing the effects of fluid loss, through dehydration, on the performance of this athlete. (7)

5.2 What are the danger signs that a coach should recognise in order to prevent the onset of dehydration? (4)

[11]

QUESTION 6

Preparing and managing an optimal training programme is key to athletic success. An important aspect of an optimal training programme is the nutritional aspect.

Compile a set of guidelines for a nutritional action plan (not a diet) for either a high performance soccer or long distance athlete.

Assume the following:

- The athlete is male between 18 – 20 years old.
- The off season is in cold, wet conditions and lasts 7 months.
- The pre-season is warmer and lasts 2 months.
- The competitive season is in hot, humid conditions and lasts 3 months with a qualifying event/match every week.

[15]

QUESTION 7

When competing at high altitude (1 000 m and above), athletic performance is affected.

7.1 Is the performance **negatively** or **positively** affected? (1)

7.2 What is the main reason that performance is affected in this way? (1)

7.3 What is the difference between oxygen pressure at sea level and at high altitude? (3)

7.4 How would this difference in oxygen pressure affect the athlete's blood at high altitude? (2)

7.5 Describe the physiological changes in the body during acclimatisation at high altitude. (8)
[15]

Question 8, 9, 10 and 11 must be answered in the Answer Booklet.

Total: 150 marks