



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2010

SPORT AND EXERCISE SCIENCE: PAPER I

Time: 2 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

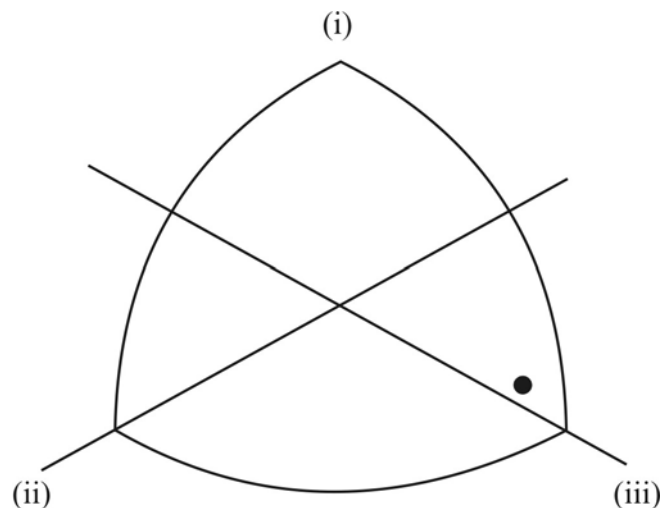
1. This question paper consists of 8 pages and an Answer Booklet of 4 pages (i – iv). Please check that your question paper is complete. Detach the Answer Booklet from the middle of the question paper.
 2. Questions 1, 2 and 4.1.1 must be answered in the Answer Booklet provided. Questions 3, 4 and 5 must be answered in your Answer Book.
 3. Read the questions carefully.
 4. Number the answers exactly as the questions are numbered.
 5. Use the total marks that can be awarded for each question as an indication of the detail required.
 6. It is in your own interest to write legibly and to present your work neatly.
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QUESTION 3**Definitions/Explanations**

- 3.1 What would occur if energy input falls below the athlete's energy output? (3)
- 3.2 What is the difference between **metabolic rate** and **basal metabolic rate**? (3)
- 3.3 Explain the following **Training Principle: Overload**. (5)
- 3.4 Explain the **Principle of Specificity**. (5)
- 3.5 Define **Plateau** when used in a performance example. (2)
- 3.6 Define the **Positive Acceleration Curve**. (2)
- [20]**

QUESTION 4

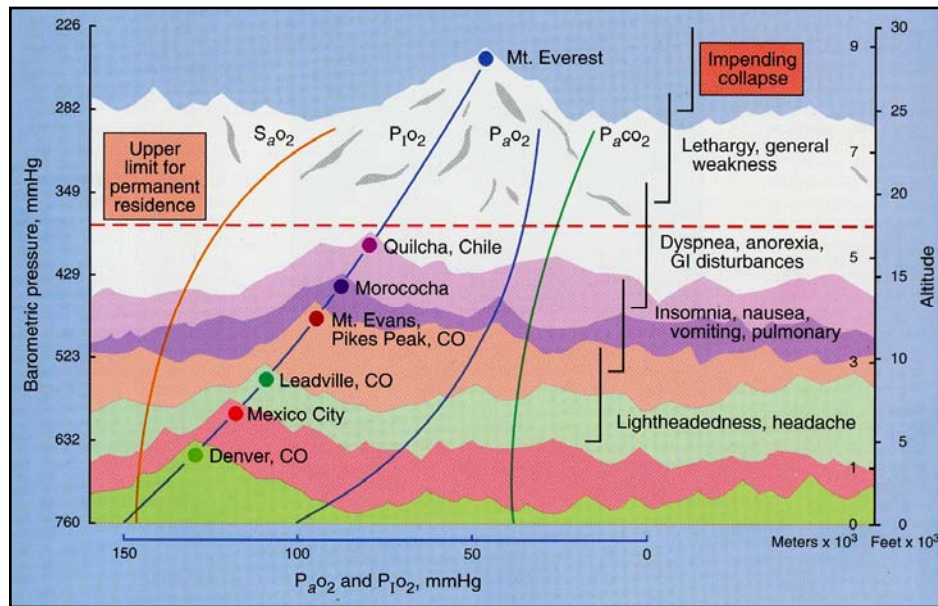
- 4.1 Study the diagram below.



[<<http://www.topendsports.com/testing/somatotype.htm>>]

- 4.1.1 Give the above diagram on page 4 of the Answer Booklet a title and provide explanatory labels. (4)
- 4.1.2 Describe the athlete who represents the plotted point on the diagram and identify the logical sport preference of that athlete. (3)
- 4.1.3 Consider how this tool may be useful to you as a coach of young children with talent in a range of sport, taking into account body shape and stature. (5)

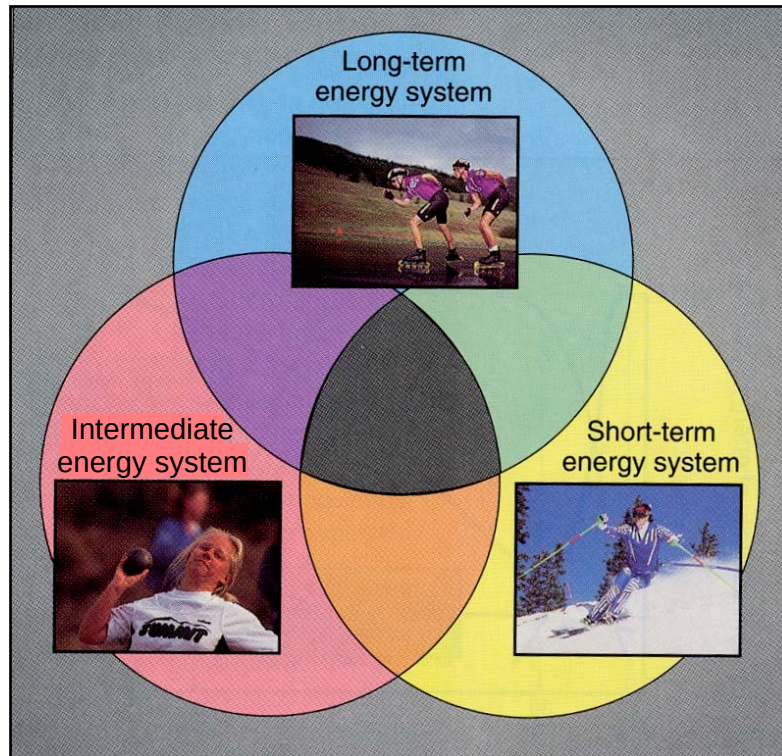
4.2



[Taken from: *Essentials of Exercise Physiology*. McArdle, Katch, Katch. 1994. Lea & Febiger]

- 4.2.1 Analyse and interpret the data in the graph. (5)
- 4.2.2 Explain the influence of limits of oxygen pressure on the performance of an athlete competing in Mexico City. (5)
- 4.2.3 What is the value of training at high altitude? (5)

4.3



[Taken from: *Essentials of Exercise Physiology*. McArdle, Katch, Katch. 1994. Lea & Febiger]

4.3.1 Long-term Energy Systems:

- (a) Provide ONE example of a sport type that depends on this energy system. (1)
- (b) This system goes through 3 stages where glucose is broken down. Name the 3 stages. (3)
- (c) Provide the name of this metabolic pathway. (1)

4.3.2 Short-term Energy Systems:

- (a) Provide ONE example of a sport type that depends on this energy system. (1)
- (b) What ingredients service this system? (2)
- (c) Provide the name of this metabolic pathway. (1)

4.3.3 Intermediate Energy Systems:

- (a) Provide ONE example of a sport type that depends on this energy system. (1)
- (b) What ingredients service this system? (2)
- (c) Provide the name of this metabolic pathway. (1)

[40]

QUESTION 5

- 5.1 You are the first team soccer coach at a girls' high school. You are due to have a 1½ hour training session, with thirty girls, when it starts raining. Luckily your school has an indoor sports centre enabling you to move the practice indoors.

You have the following equipment available to use:

- Skipping ropes
- Ladders
- Stop watch
- Mini hurdles
- Medicine balls
- Dumbbells
- Mats
- Steps
- Resistor bands
- 1 × Wobble board
- 15 soccer balls
- Cones

- 5.1.1 Set up a fitness training circuit for the soccer team. There must be 10 stations. You may use a diagram to assist with your explanation.

The stations need to be ordered appropriately, selected logically and managed effectively.

Consider the number of repetitions and sets. (20)

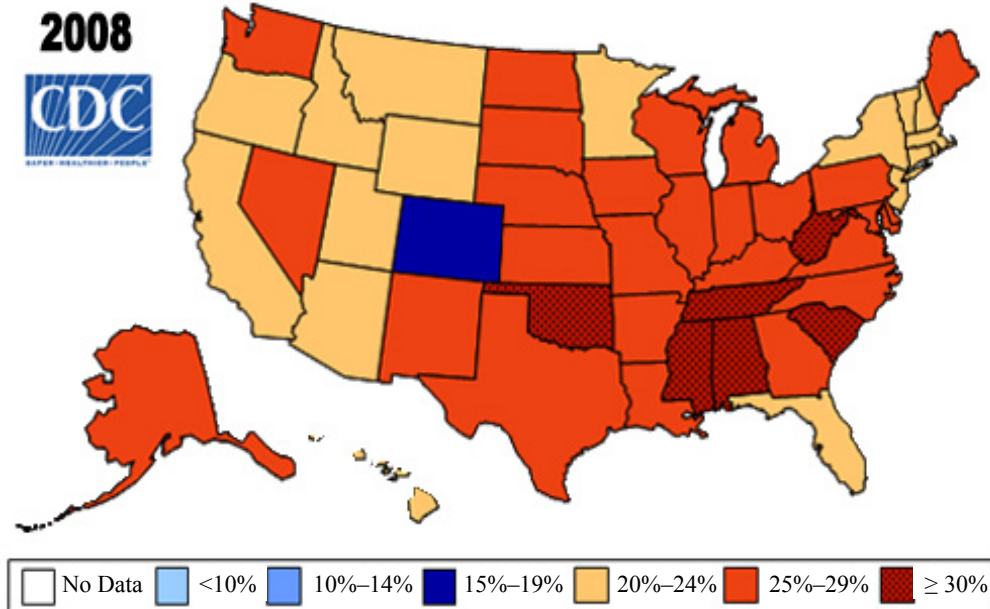
- 5.1.2 How would you manage the Warm Up and Cool Down? (10)

5.2 Obesity around the world.

Study the following source material comparing evidence of obesity across the globe. Then answer the questions that follow.

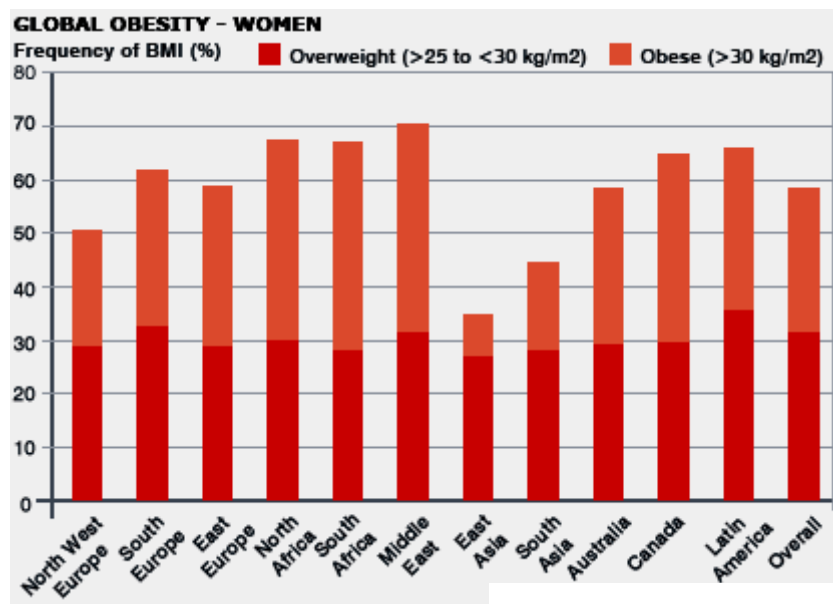
SOURCE A

Map of obesity in America



[<<http://www.cdc.gov/obesity/data/trends.html>> May 2010]

SOURCE B



[Source: American Heart Association]
[<<http://newsimg.bbc.co.uk/>> May 2010]

SOURCE C

Baby bench press

More gyms in the US are catering for out-of-shape children, writes Sheba Wheeler.

As schools cut Physical Education classes in favour of more classroom time, private gyms and public recreation centres are picking up the slack for active children and teens.

Rick Schliebe, manager of Club USA says he was motivated to start a programme for kids after witnessing a painful moment in one boy's life.

"I was in the locker room 3 years ago, and some kids were picking on an obese boy," Schliebe says. "One kid said to him, 'You are so fat, you can block the sun!' I caught the hurt in that little boy's eyes."

He was troubled by the statistics: 30% of American kids are overweight or at risk of becoming overweight. Even more upsetting were stats that showed 80% of those children's parents were obese, too.

[Adapted from *Sunday Times*, 28 October 2007]

Isn't it interesting that this minor story, set in America, was reported in the South African press? Possibly this was because obesity is a global problem with South Africa catching up to America at a rapid rate.

Obese children have to deal with many issues including bullying and health problems.

- 5.2.1 As a Physical Education teacher, you have noticed a drop-off in sport participation and an increase in obesity.

Discuss the variety of factors that could affect sport participation.

The table is a guideline to assist you. You need to mention each of the factors in your answer.

Family	Health status	Education
Culture	Environment	Physical aptitude
Economic status	Physical engagement	Nutritional status

(30)

5.3 Examine the following diet.

Breakfast

1 cup coffee with full cream milk
1 slice pawpaw
2 fried eggs
Bacon
3 slices toast – white bread
Strawberry jam

Lunch

2 hot dogs with relish
Coke
1 apple

Afternoon snack

1 cup coffee with full cream milk
1 chocolate éclair

Supper

Lasagne
French salad
1 white bread roll

Ice cream and chocolate sauce

- 5.3.1 What TWO recommendations would you make to the person eating this diet, should they wish to lose weight? (2)
- 5.3.2 What TWO adaptations would you make to this diet should the user be preparing for a rugby match? State why you have made these choices. (5)
- 5.3.3 What TWO adaptations would you make to this diet should the user be preparing for an endurance event? State why you have made these choices. (5)
- [72]

Total: 150 marks