2001 HIGHER SCHOOL CERTIFICATE EXAMINATION

Personal Development, Health and Physical Education

Section I – Part B (continued)

In your answers you will be assessed on how well you:

- demonstrate an understanding of health and physical activity concepts
- apply the skills of critical thinking and analysis
- illustrate your answer with relevant examples
- present ideas in a clear and logical way

Marks

Question 22 — Factors Affecting Performance (20 marks)

(a) Describe how an athlete's level of arousal affects performance. **4**

It is important that athletes achieve optimum arousal for performance, otherwise it can have a detrimental affect on performance. The widely accepted 'inverted U hypothesis' shows that if an athlete is aroused too little or too much their performance will be negatively affected. It is important athletes are aroused appropriately for their performance as it is necessary, but arousal should not be too high. Arousal can be reduced through relaxation techniques such as focusing. If athletes are not aroused, they will not be ready for action and if they are too aroused too many muscles will be activated and clumsy movements will result.

Question 22 continues on page 14

Marks

Question 22 (continued)

(b) Discuss how prescribed judging criteria are used to measure the quality of a performance. **6**

Prescribed judging criteria is a favoured method of judging the quality of a performance because it is more objective than personal judging criteria.

Prescribed judging criteria maintains its objectivity as it is judging against set outcomes. Outcomes and characteristics ~~are~~ of a skilled performance are collaborated to form a 'checklist' which is used by the judges. Competitors are compared against the checklist so judges can identify whether their performance contains characteristics of a skilled performance and outcomes of a skilled performance.

Question 22 continues on page 15

Marks

Question 22 (continued)

(c) Analyse the physiological adaptations that occur when an untrained individual undertakes a 20-week aerobic training program. **10**

Many physiological adaptations occur when an aerobic training program is undertaken. These include haemoglobin level, oxygen uptake, resting heart rate, stroke volume (and cardiac output), lung capacity and blood pressure.

Due to the increased demand for oxygen that the muscles feel during an aerobic exercise, oxygen carrying red blood cells are increased so as to cope with the demand. The body becomes adaptive to this need and increases the cells which also contain haemoglobin. Due to the increase in red blood cells, haemoglobin levels also increase.

Oxygen uptake is the best indicator of aerobic fitness as it tests how effectively the body uses oxygen. Oxygen uptake increases as a result of training due to the increased need for oxygen. The body is forced to be more efficient so as to deliver adequate oxygen to the muscles. Therefore, oxygen uptake will increase.

Resting heart rate will decrease significantly, possibly as low as 40 beats per

Question 22 continues on page 16

Question 22 (continued)

minute. This is a direct result of an increased stroke volume. Stroke volume refers to the amount of blood pumped out by the heart with each beat. As a result of exercise, the heart muscle grows stronger creating more powerful contractions resulting in a higher stroke volume. As a result of the increased stroke volume, the heart does not need to pump as many times in order to get the same amount of blood out as it did before training. Less contractions are possible because of the more powerful heart beats. Increased stroke volume leads to decreased heart rate. Cardiac output remains unchanged as stroke volume increases and heart rate decreases.

Lung capacity remains relatively unchanged at around 6000mLs. Exercise will not increase the size of the lungs despite more efficient use of this system. Tidal volume increases whilst residual decreases as a result of aerobic training meaning that lung capacity remains unchanged.

Blood pressure decreases as a result of aerobic training due to increased elasticity in the arterial walls. Due to the increased need for oxygen carrying blood, the walls expand and contract faster resulting in improved (decreased) blood pressure.

End of Question 22