**Energy Systems Questions**

**Systems**

**Explain how the regeneration of ATP is achieved during their programme.**

***(4 marks)***

1. Carbohydrates/glycogen/glucose broken down into pyruvate

2. Anaerobic/glycolysis

3. Some ATP produced

4. Fats/triglycerides/fatty acids/glycerol broken down into variety of compounds

5. Beta oxidation

6. Into mitochondria

7. Krebs cycle

8. Electron transport chain

9. Oxidation/aerobic

10. Large quantities

**Explain how energy is provided, allowing the athlete to complete the shot put. *(3 marks)***

*3 marks for 3 of*

A. Stored ATP

B. Alactic system/ATP-PC system/Phosphocreatine system/ATP-CP system

C. PC breakdown

D. To creatine and phosphate/C and P

E. Energy used/released to perform the contraction/re-synthesis for ATP

**Using your knowledge of energy systems, outline and explain the relationship between energy**

**sources and intensity of exercise. *(7 marks)***

*7 marks for 7 of:*

A. At low level of exercise energy comes from a mixture of fats and carbohydrates;

B. Broken down aerobically/using oxygen/aerobic system;

C. Glycolysis/Anaerobic Glycolysis – glucose broken down/pyruvic acid/pyruvate formed

D. Beta oxidation breaks down fats/tri-glycerides/free fatty acids

E. Krebs Cycle – oxidation of acetyl-coenzyme-A/Citric acid production

F. Electron transport/transfer chain – water formed/hydrogen ions/protons used

G. At high levels of intensity carbohydrates are only energy source/as intensity increases, more carbohydrates used;

H. At high intensity fat use limited by oxygen availability/no fats used anaerobically/lack of oxygen;

I. Slower energy release from fats/quick release of energy from

carbohydrates;

J. (Carbohydrate break down) Lactic Acid System/Lactate anaerobic system

K. No oxygen used/anaerobic

L. Glycolysis/Anaerobic Glycolysis – glucose broken down/pyruvic acid/pyruvate formed/lactate/lactic acid formed

**Sources**

**Ice skaters will normally perform a four to five minute routine for their long programme section in a major championship**

**During a four minute skating programme, what will be the main ‘energy source’s’ used?**

***(3 marks)***

1. Fats/fatty acids/glycerol

2. Triglycerides

3. Lactate/protein/amino acids/lactic acid/creatine

4. Glycogen

5. Glucose/sugar

6. Carbohydrate

**Athletes must have sufficient energy stores to compete and perform in a variety of weather conditions.**

**Identify the energy sources that a performer may use during competition. *(3 marks)***

*3 marks for 3 of:*

A. Carbohydrates/Glucose/Glycogen

B. Protein/Lactate/Amino acids

C. Fats/Fatty acids/Glycerol/Triglycerides

D. Creatine/phosphocreatine