1.20 Respiration, Exercise and Metabolism: 10-minute Pack

Total Marks

AQA 8464 · Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Metabolism includes many enzyme-controlled reactions. One example is converting excess glucose to glycogen for storage in the liver.

(a) Describe the role of enzymes in metabolism. **(2)**

(b) Give one example of an anabolic process in human metabolism other than glycogen formation. **(1)**

(Total for Question 1 is 3 marks)

2 During a 400 m sprint, Ffion's leg muscles cannot get enough oxygen from her blood to meet demand.

(a) Name the type of respiration taking place in Ffion's leg muscles when oxygen supply cannot meet demand. **(1)**

(b) State the substance that builds up in Ffion's muscles as a result. **(1)**

(c) Explain why a build-up of this substance causes Ffion's muscles to feel fatigued. **(2)**

(Total for Question 2 is 4 marks)

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3 Higher tier only. The word equation for fermentation in yeast can also be written as a balanced symbol equation.

(a) Write the balanced symbol equation for anaerobic respiration in yeast cells. **(2)**

(Total for Question 3 is 2 marks)

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Mark scheme · 1.20 Respiration, Exercise and Metabolism: 10-minute Pack

Question 1

(a) enzymes speed up metabolic reactions by lowering activation energy, oe **B1**

(a) they are specific and control pathways such as synthesis and breakdown, oe **B1**

(a) Answer: Enzymes speed up metabolic reactions by lowering activation energy and are specific catalysts that control synthesis and breakdown pathways.

(b) any valid anabolic process in human metabolism other than glycogen formation, e.g. protein synthesis from amino acids or lipid synthesis from glycerol and fatty acids, oe **B1**

(b) Answer: Protein synthesis from amino acids.

Question 2

(a) anaerobic respiration **B1**

(a) Answer: Anaerobic respiration.

(b) lactic acid **B1**

(b) Answer: Lactic acid.

(c) lactic acid is acidic and lowers the pH inside muscle cells as it builds up, oe **B1**

(c) this interferes with muscle contraction/enzyme function, causing pain, cramp and fatigue, oe **B1**

(c) Answer: Lactic acid is acidic and lowers the pH inside the muscle cells as it builds up. This interferes with muscle contraction and enzyme function, causing the muscles to feel painful, cramped and fatigued (oe).

Question 3

(a) $C_6H_{12}O_6$ as the only reactant **B1**

(a) $2C_2H_5OH + 2CO_2$ as the products, correctly balanced **B1**

(a) Answer: $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

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