1. June/2022/Paper_41/No.3

Respiration is a process that results in the synthesis of ATP. The ATP can be used within the cell for energy-requiring reactions and processes.

There are four stages in aerobic respiration: glycolysis, the link reaction, the Krebs cycle and oxidative phosphorylation.

(a) The ATP synthesised in respiration can be used to make larger and more complex biological molecules from smaller molecules.

Name the type of reaction that occurs when larger more complex biological molecules are made from smaller molecules.

..... [1]

(b) The first part of glycolysis uses ATP.

Explain why ATP is needed in the first part of glycolysis.

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..... [2]

(c) State the precise locations of substrate-linked phosphorylation reactions in aerobic respiration.

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..... [1]

(d) Explain what happens to pyruvate in the link reaction in aerobic respiration.

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..... [2]

(e) Chemiosmosis is a process that occurs in mitochondria during aerobic respiration and in chloroplasts during photosynthesis.

Describe the differences between the process of chemiosmosis in mitochondria and the process of chemiosmosis in chloroplasts.

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..... [3]

[Total: 9]

2. June/2022/Paper_42/No.3

Aerobic respiration occurs when oxygen is available. A much greater energy yield is obtained from aerobic respiration than from respiration in anaerobic conditions.

(a) Explain why the link reaction only occurs when oxygen is available.

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(b) Outline the stage of aerobic respiration that occurs in the cytoplasm of eukaryotic cells.

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[Total: 9]

3. June/2022/Paper_43/No.3

(a) ATP is synthesised from ADP and P_i in a phosphorylation reaction.

State the **two** different ways in which this phosphorylation reaction occurs in aerobic respiration.

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..... [2]

(b) Coenzymes are important in all four stages of aerobic respiration.

Describe **and** explain the role of the coenzymes NAD and FAD in aerobic respiration.

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(c) The enzyme pyruvate dehydrogenase catalyses the link reaction. Pyruvate dehydrogenase is inhibited when the ratio of acetyl coenzyme A to coenzyme A increases.

Suggest the importance of this inhibition to the functioning of the cell.

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..... [2]

[Total: 10]