

8.2 Cell Respiration

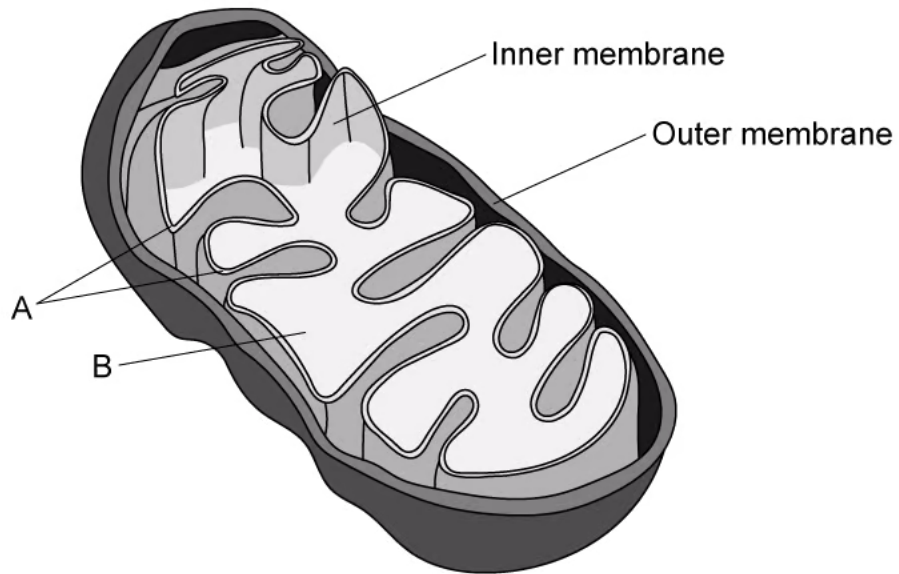
Question Paper

Course	DP IB Biology
Section	8. Metabolism, Cell Respiration & Photosynthesis (HL Only)
Topic	8.2 Cell Respiration
Difficulty	Easy

Time allowed: 60
Score: /43
Percentage: /100

Question 1a

a)
The diagram shows a mitochondrion.



Identify the parts labelled **A** and **B**.

[2 marks]

[2 marks]

Question 1b

b)
The stages of respiration take part in different locations in a cell as shown in the table below.

Complete the missing parts of the table.

Stage of respiration	Location in cell
	Cytoplasm
Link Reaction	
Krebs cycle	Matrix of mitochondria
Oxidative phosphorylation	

[3 marks]

[3 marks]

Question 1c

c)

Mitochondria are highly adapted to carry out respiration. One adaptation is a highly folded inner membrane, the cristae.

Describe how the folding of a membrane is an adaptation of an organelle such as the mitochondria.

[1 mark]

[1 mark]

Question 1d

d)

Anaerobic respiration also occurs in the mitochondria.

State the names of the two stages of anaerobic respiration.

[1 mark]

[1 mark]

Question 2a

a)

Respiration can be represented by a chemical equation.

State the balanced chemical equation for aerobic respiration.

[2 marks]

[2 marks]

Question 2b

b)
Respiration involves the oxidation and reduction of chemical compounds.

Define oxidation in terms of electrons lost or gained.

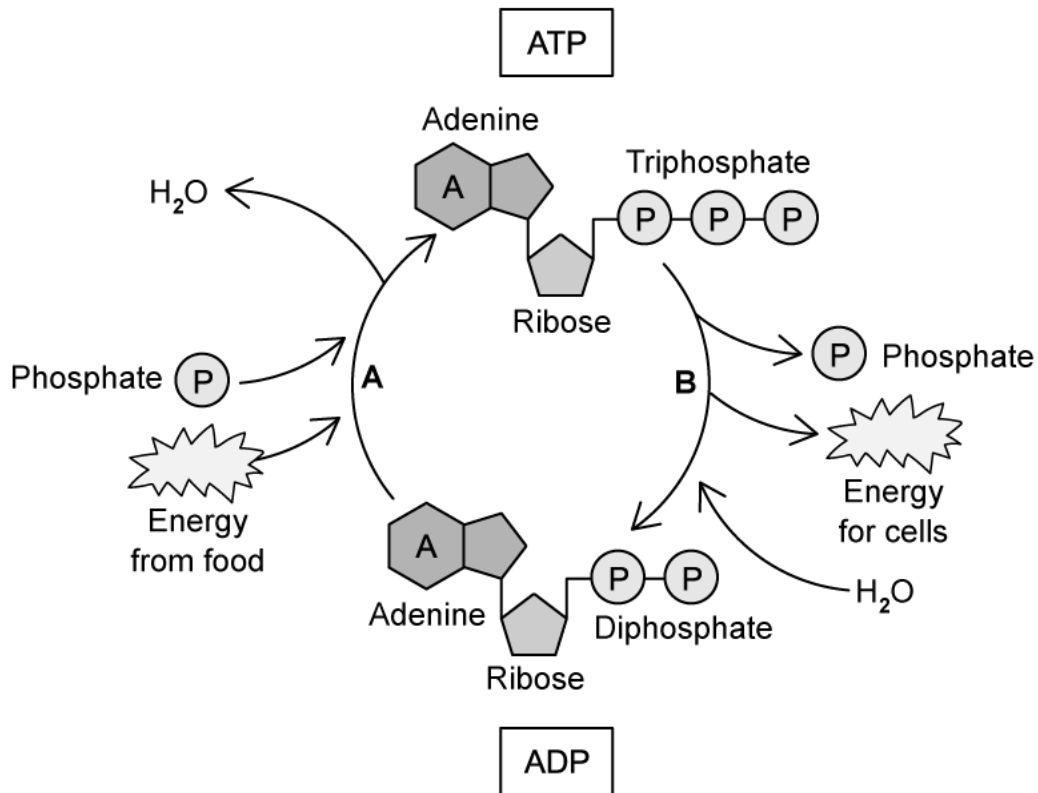
[1 mark]

[1 mark]

Question 2c

c)
The diagram below shows the cyclic formation of ATP from ADP.

Use the diagram to identify which of processes **A** and **B** is the process of phosphorylation.



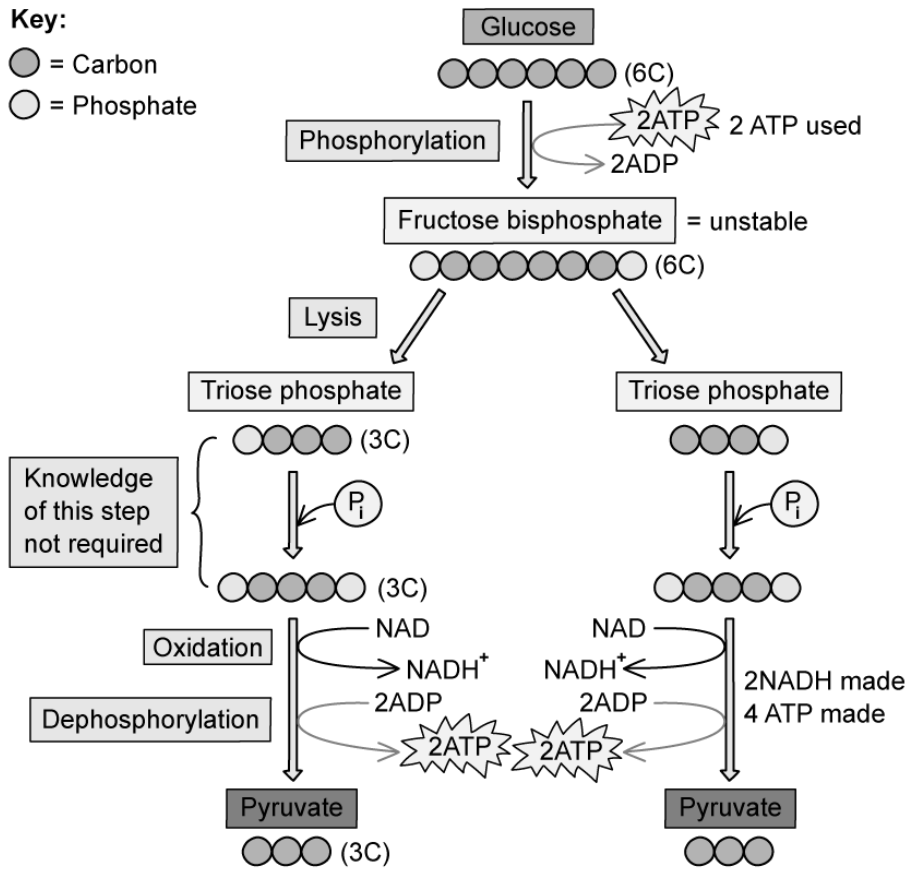
[1 mark]

[1 mark]

Question 2d

d)
Phosphorylation occurs during the process of glycolysis.

Use the diagram below to describe phosphorylation during glycolysis.



[2 marks]

[2 marks]

Question 3a

a)
The Link Reaction is described as an oxidative decarboxylation reaction.

State which molecule is decarboxylated during the Link Reaction.

[1 mark]

[1 mark]

Question 3b

b)

Coenzyme A is a molecule used in the Link Reaction,

State the role of coenzyme A in the Link Reaction.

[2 marks]

[2 marks]

Question 3c

c)

During the Krebs cycle, two molecules of carbon dioxide are released.

State how many molecules of carbon dioxide are released in the Krebs cycle per glucose molecule.

[1 mark]

[1 mark]

Question 3d

d)

The coenzyme NAD is reduced six times during the Krebs cycle stage of respiration.

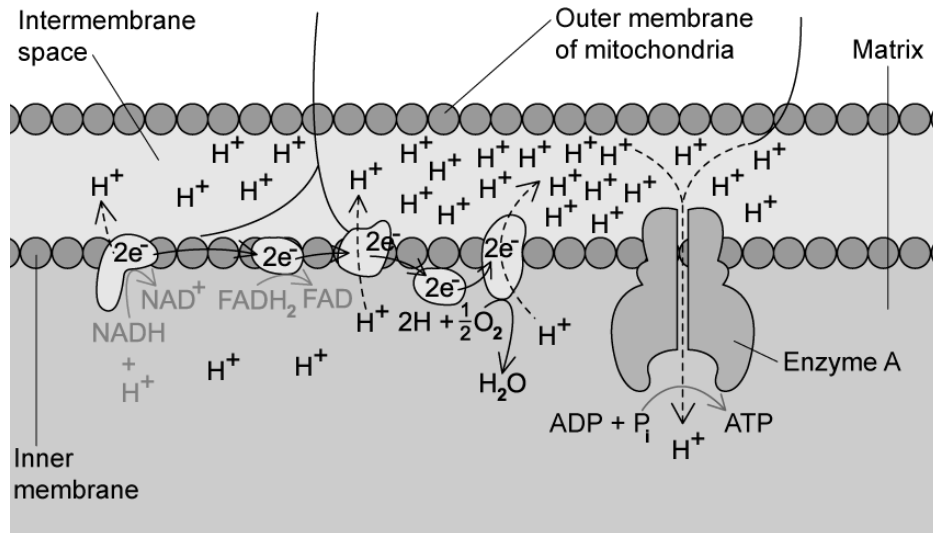
Describe the events that occur to the molecule of NAD in order to reduce it.

[2 marks]

[2 marks]

Question 4a

a)
The diagram below shows the process of oxidative phosphorylation.



Identify enzyme A from the diagram.

[1 mark]

[1 mark]

Question 4b

b)
Describe the role of enzyme A from the diagram in part (a).

[3 marks]

[3 marks]

Question 4c

c)

An important process in respiration is the electron transport chain. This uses a series of redox reactions where electrons, donated from specific molecules, are transported through a chain of electron carriers.

State the two molecules which act as electron donors in the electron transport chain.

[2 marks]

[2 marks]

Question 4d

d)

Oxygen is described as the final electron acceptor in the electron transport chain.

Explain the importance of oxygen as the final electron acceptor.

[3 marks]

[3 marks]

Question 5a

One mark is available for clarity of communication throughout this question.

a)

Describe the steps involved in the link reaction.

[3 marks]

[3 marks]

Question 5b

b)

Describe the role of the inner membrane of the mitochondria.

[4 marks]**[4 marks]****Question 5c**

c)

The four main stages of aerobic respiration are glycolysis, the link reaction, Krebs cycle and oxidative phosphorylation.

Describe each stage, including the location of each.

[8 marks]**[8 marks]**



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