

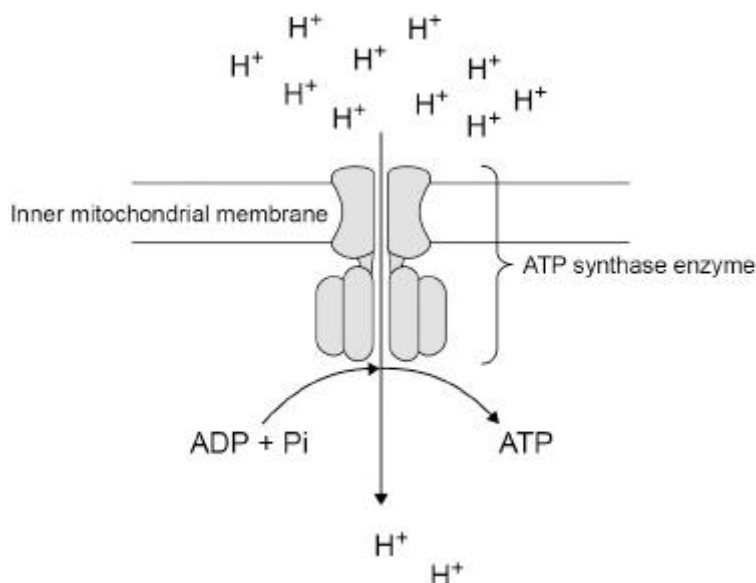
Name of the Student: _____

Max. Marks : 24 Marks

Time : 24 Minutes

Q1.

- (a) The figure below shows an ATP synthase enzyme in the inner mitochondrial membrane.



Complete the passage with the appropriate terms.

ATP synthase comprises several polypeptides, so is said to have

a _____ structure.

It catalyses the synthesis of an ATP molecule by a _____

reaction; this involves the _____ of a water molecule.

The ATP synthase in the figure above is in a mitochondrion so would catalyse reactions during _____.

(2)

- (b) As shown in the figure above, ATP synthase has two functions.

- It catalyses the synthesis of ATP.
- It allows the movement of H^+ ions.

Suggest how the shape of the ATP synthase allows it to have these two functions.

Explain your answers.

Catalyses the synthesis of ATP _____

Allows the movement of H^+ ions _____

(4)
(Total 6 marks)

Q2.

Galacto-oligosaccharides (GOS) are polymers of galactose.

(a) Explain why GOS are described as polysaccharides.

(2)

(b) Give **two** differences between the structures of GOS and lactose.

1

2

(2)

(c) Explain why amylase produced in the human digestive system does not digest GOS.

(2)

(d) Prebiotics are foods used to promote good health in humans.

Prebiotics stimulate the growth of 'healthy' bacterial populations in the human digestive system.

The bacteria in these 'healthy' populations produce enzymes that hydrolyse GOS.

Suggest how GOS can work as a prebiotic.

(3)
(Total 9 marks)

Q3.

- (a) Describe the hydrolysis reactions involved in the digestion of triglycerides.

Do **not** write about the activity of lipase.

(2)

- (b) All mammals produce a lipase called CEL.

CEL digests triglycerides.

CEL is activated by bile salts binding to the enzyme.

Describe **two** other functions of bile salts.

1 _____

2 _____

(2)

- (c) Mammals feed their young on milk. CEL digests the triglycerides in milk. The ability to produce CEL occurred due to a gene mutation.

Describe how natural selection may have led to all mammals in a population producing CEL.

(4)
(Total 8 marks)