Practice Question Set For A-Level
Subject : Biology
Paper-1 Topic: 2 Cells

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Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

Read the following passage.

Carbohydrates are moved by mass transport in plants and in mammals. This movement is caused by a pressure gradient inside the transport vessels.

Plants transport most of their carbohydrate as sucrose. The phloem has sucrose-transport proteins in the cell-surface membrane. Potato plants with fewer sucrose-transport proteins produce fewer potatoes and accumulate sugars in their leaves.

Mammals do not have sucrose-transport proteins in their cell-surface membranes. They do have many monosaccharide-transport proteins in cell-surface membranes. These transport proteins allow monosaccharides through by facilitated diffusion.

Mammalian cells can change the number of glucose-transport proteins in their cell-surface membranes. The glucose-transport proteins are stored in internal membranes, then moved to the cell-surface membrane when they are needed. During exercise, there is a significant increase in glucose uptake by muscle cells.

Use the information in the passage and your own knowledge to answer the following questions.

(a) Explain how sucrose-transport proteins in leaf cells enable the production of a pressure gradient in the phloem.

_____

_____

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_____

(3)

(b) Potato plants with fewer sucrose-transport proteins produce fewer potatoes and accumulate sugars in their leaves (lines 4, 5 and 6).

Explain why.

_____

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(2)

(c) During exercise, there is a significant increase in the glucose uptake by muscle cells (lines 14 and 15).

Give **two** reasons why glucose uptake by muscle cells increases significantly during exercise.

Explain your answers.

1 _____

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2 _____

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_____

(4)

(d) Which statement correctly describes the structure of both a sucrose-transport protein and a glucose-transport protein?

Tick ✓ **one** box.

The secondary structure is held by disulfide bridges.
The tertiary structure allows the protein to be positioned on the inner surface of the cell membrane. ☐

The secondary structure is held by disulfide bridges.
The tertiary structure allows the protein to be positioned spanning the whole cell membrane. ☐

The secondary structure is held by hydrogen bonds.
The tertiary structure allows the protein to be positioned on the outer surface of the cell membrane. ☐

The secondary structure is held by hydrogen bonds.
The tertiary structure allows the protein to be positioned spanning the whole cell membrane. ☐

(1)

(Total 10 marks)

Q2.

(a) Which statement about the function of ribosomes is correct?

Tick ✓ **one** box.

Site of transcription, catalyse the joining of amino acids by hydrolysis reactions	☐
Site of transcription, catalyse the joining of nucleotides by condensation reactions	☐
Site of translation, catalyse the joining of amino acids by condensation reactions	☐
Site of translation, catalyse the joining of nucleotides by hydrolysis reactions	☐

(1)

(b) Name **two** biological molecules that can be coded for by a gene.

Do **not** include a polypeptide or protein in your answer.

1 _____

2 _____

(1)

(c) Scientists investigated the structure of the endoplasmic reticulum.

The table below shows some of the scientists' results.

Type of endoplasmic reticulum	**Percentage of endoplasmic reticulum made of phospholipids**
Rough	46.8
Smooth	52.5

Use the data in the table to suggest how the structure of rough endoplasmic reticulum is different from the structure of smooth endoplasmic reticulum **and** how this is related to their functions.

_____

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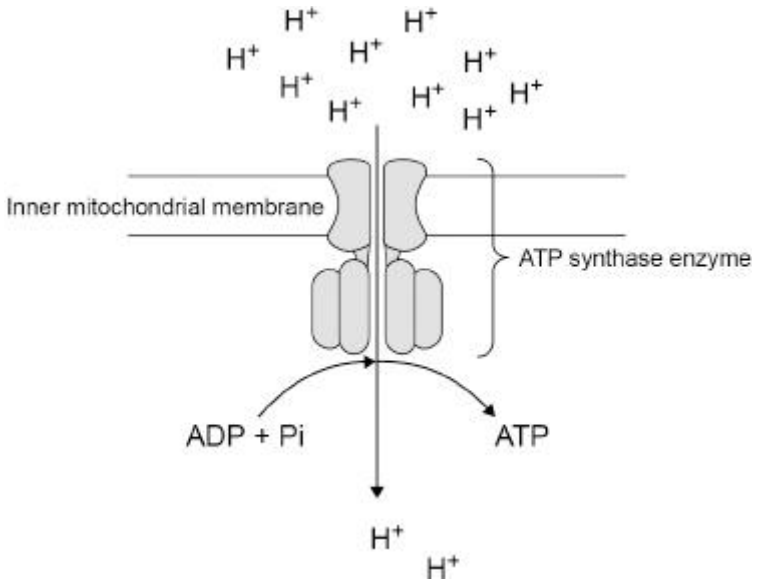
(3)
(Total 5 marks)

Q3.

(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)