

# 4.1 Fluid Mosaic Membranes

## Question Paper

Course	CIE A Level Biology (9700) exams from 2022
Section	4. Cell Membranes & Transport
Topic	4.1 Fluid Mosaic Membranes
Difficulty	Medium

**Time allowed:** 10

**Score:** /10

**Percentage:** /100

### Question 1

Which row correctly matches the molecules found in the cell surface membrane with their function?

	form hydrogen bonds with water	act as receptor sites for hormones	recognise antibodies
<b>A</b>	proteins and glycolipids	phospholipids and cholesterol	cholesterol and proteins
<b>B</b>	cholesterol and proteins	proteins and glycolipids	phospholipids and cholesterol
<b>C</b>	glycolipids and glycoproteins	glycolipids and glycoproteins	glycolipids and glycoproteins
<b>D</b>	phospholipids and cholesterol	cholesterol and proteins	proteins and glycolipids

[1 mark]

### Question 2

Cystic fibrosis causes a defect in the cell surface membrane of epithelial cells, disrupting the transport of chloride ions out of affected cells.

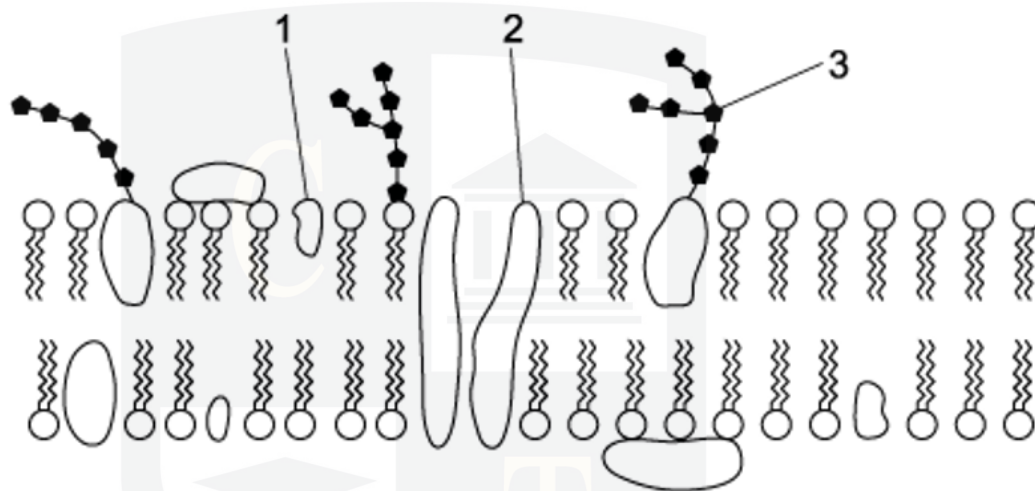
Which membrane component is involved?

- A** cholesterol
- B** protein
- C** glycolipid
- D** phospholipid

[1 mark]

### Question 3

A section of a cell surface membrane is shown in the diagram below.



What is the correct function for each of the structures labelled?

	regulates membrane fluidity	forms hydrogen bonds with water to stabilise membrane	transports ions and large polar molecules
<b>A</b>	1	1	2
<b>B</b>	3	2	1
<b>C</b>	2	1	3
<b>D</b>	1	3	2

[1 mark]

#### Question 4

An increase in which bond type will increase the fluidity of the cell surface membrane?

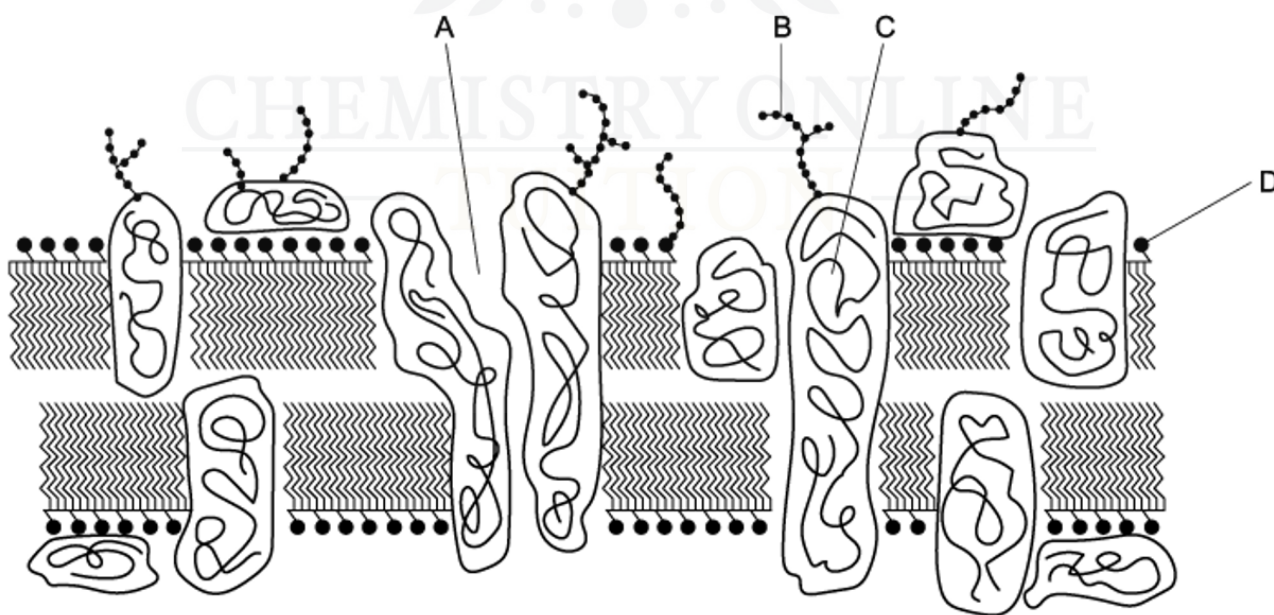
- A hydrogen
- B C – O – C
- C C – N
- D C = C

[1 mark]

#### Question 5

When an individual requires a blood transfusion it is important that their blood type is known. Humans have 4 different blood types and if the incorrect type is used it can lead to the body rejecting the new blood.

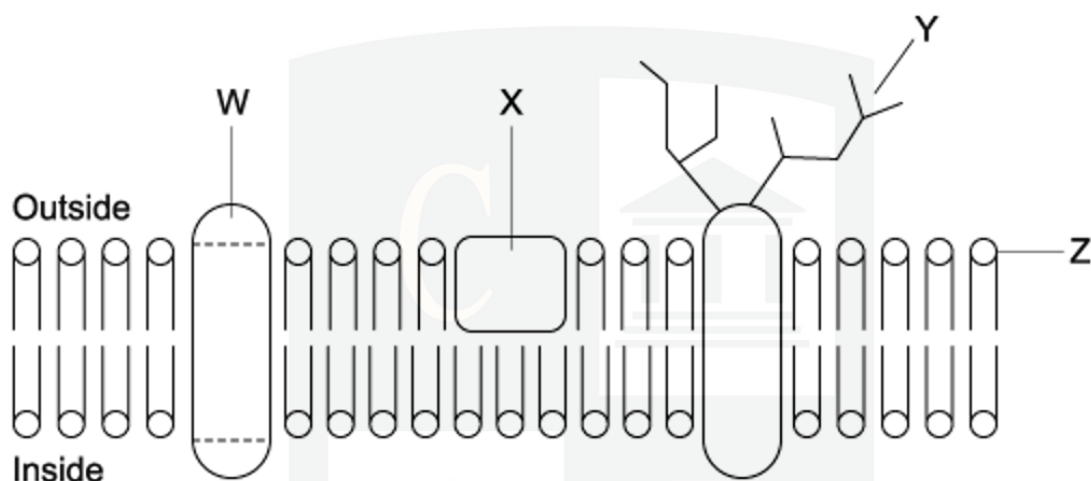
Which label shows the part of a molecule that is different on the cell surface membrane of red blood cells of different blood types?



[1 mark]

### Question 6

A section of a cell surface membrane is shown in the diagram below.



Four functions of a cell surface membrane are listed:

- 1 movement of fat-soluble molecules
- 2 gives the cell shape
- 3 cell recognition
- 4 movement of ions

Which molecule is correctly paired with its function?

- A** W and 1      **B** X and 2      **C** Y and 3      **D** Z and 4

[1 mark]

### Question 7

A water-soluble signalling molecule binds to the cell surface membrane, causing the following processes to occur.

- 1 Enzyme catalysed reaction
- 2 2<sup>nd</sup> messenger production
- 3 Protein receptor conformational change
- 4 G-protein activation

What is the correct sequence of events in the cell signalling pathway?

- A 1 → 2 → 3 → 4
- B 3 → 4 → 1 → 2
- C 1 → 2 → 4 → 3
- D 2 → 4 → 3 → 1

[1 mark]

### Question 8

Temperature affects the fluidity of the cell surface membrane. Single celled species that cannot internally control their temperature, such as bacteria and yeast, change the composition of their membrane to maintain membrane structure.

How could bacteria and yeast adapt to an environment with a low temperature?

- A Decrease the amount of intrinsic proteins
- B Decrease the amount of cholesterol
- C Increase the proportion of saturated phospholipids
- D Increase the proportion of unsaturated phospholipids

[1 mark]

**Question 9**

Which row correctly describes the hydrophobicity of cell surface membrane molecules?

	Interior of a transport protein	Exterior of an intrinsic protein	Carbohydrate chain on a glycolipid
<b>A</b>	hydrophobic	hydrophilic	hydrophilic
<b>B</b>	hydrophobic	hydrophobic	hydrophobic
<b>C</b>	hydrophilic	hydrophilic	hydrophobic
<b>D</b>	hydrophilic	hydrophobic	hydrophilic

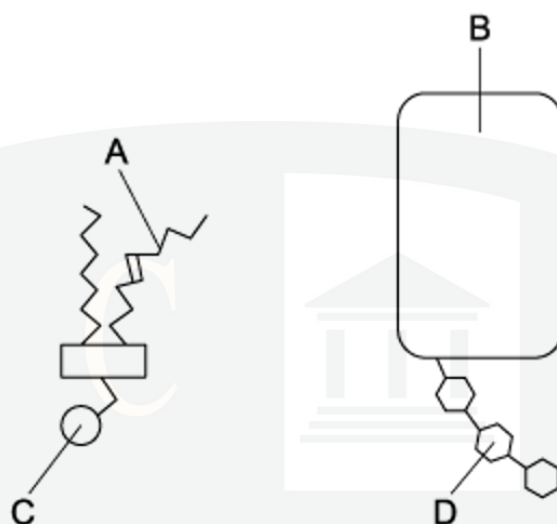
[1 mark]

CHEMISTRY ONLINE  
— TUITION —

### Question 10

Two cell surface membrane molecules are shown in the diagrams below.

Which part affects the fluidity of the membrane?



[1 mark]

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