AQA – Biological Molecules – AS Biology P2

1. June/2021/Paper_2/No.1

0 1 . 1 The general structure of a fatty acid is RCOOH.

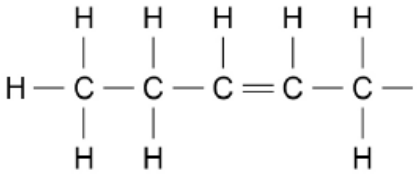
Name the group represented by COOH.

[1 mark]

_____

0 1 . 2 **Figure 1** shows the structure of a fatty acid R group.

Figure 1



Name the type of R group shown in **Figure 1**.

Explain your answer.

[2 marks]

Type of R group _____

_____

Explanation _____

_____

0 1 . 3 Describe how you would test for the presence of a lipid in a liquid sample of food.

[2 marks]

_____

_____

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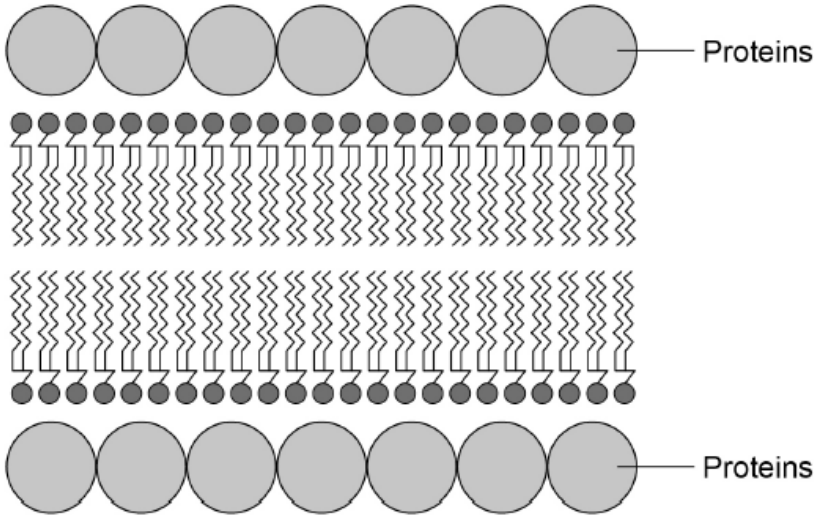
In 1935, scientists suggested a model for the chemical structure of a cell-surface membrane. **Figure 2** shows the membrane structure the scientists suggested.

Figure 2



0 1 . 4 Give **one** similarity and **two** differences between the membrane structure shown in **Figure 2** and the fluid-mosaic model of membrane structure.

[3 marks]

Similarity _____

_____

Difference 1 _____

_____

Difference 2 _____

_____

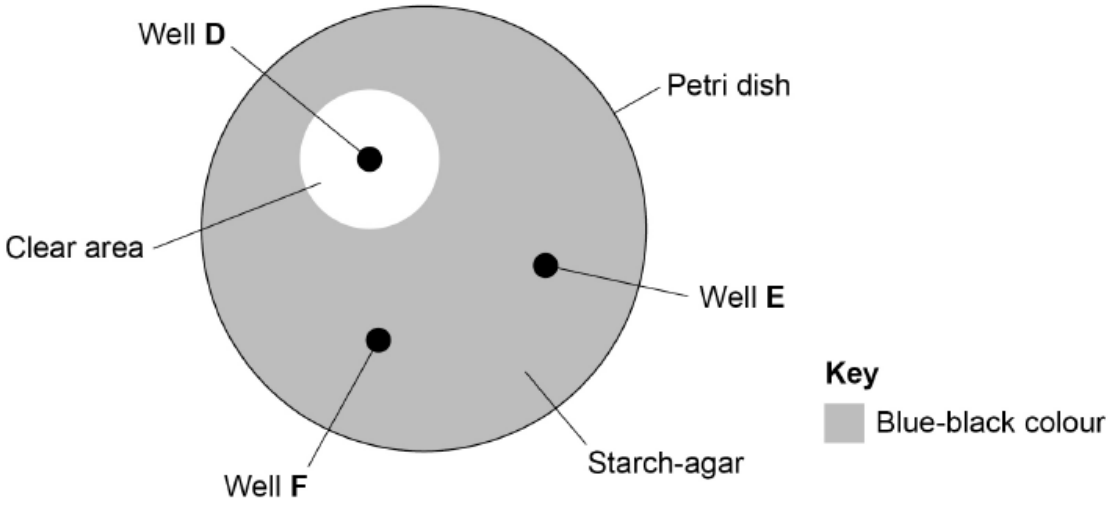
2. June/2021/Paper_2/No.5

0 5 A student investigated the activity of the enzyme amylase. He cut three identical wells (**D**, **E** and **F**) in starch-agar in a Petri dish. He added 0.2 cm^3 of:

- amylase solution to well **D**
- boiled amylase solution to well **E**
- water to well **F**.

After 60 minutes, he covered the starch-agar with iodine solution.
Figure 7 shows his results.

Figure 7



0 5 . 1 Explain the appearance of the agar in the clear area surrounding well **D**.

[2 marks]

0 5 . 2 What can you conclude about the activity of amylase from the appearance of the agar surrounding well **E** and well **F** in **Figure 7**?

[2 marks]

0 5 . 3 The student cut out a piece of agar from the clear area surrounding well **D**. He obtained a solution of the substances contained in this piece of agar.

Describe a different biochemical test the student could use with this solution to confirm that amylase had affected the starch in the clear area surrounding well **D**.

[2 marks]

The diameter of the clear area around well **D** is 18 mm

In a different investigation, the student prepared a dilution of the amylase solution. He did this by mixing amylase solution and water in the volumes shown in **Table 1**.

Table 1

Amylase solution / cm^3	Water / cm^3
1.6	2.4

He prepared a starch-agar Petri dish identical to **Figure 7**, but with a single well. He added 0.2 cm^3 of the diluted amylase solution to this well and left the Petri dish for 60 minutes.

0 5 . 4 Use all of this information to predict the diameter of the clear area that will form around the well containing the diluted amylase solution.

Give your answer to the nearest whole number.

Show your working.

[2 marks]

Answer _____ mm

0 5 . 5 The student used a ruler to measure the diameter in mm of the clear area around well **D** in **Figure 7**.

Use this information to explain why the answer to Question **05.4** should be given to the nearest whole number.

[1 mark]

_____

_____

_____

3. June/2021/Paper_2/No.7

0 7 . 1 Describe how an ATP molecule is formed from its component molecules.

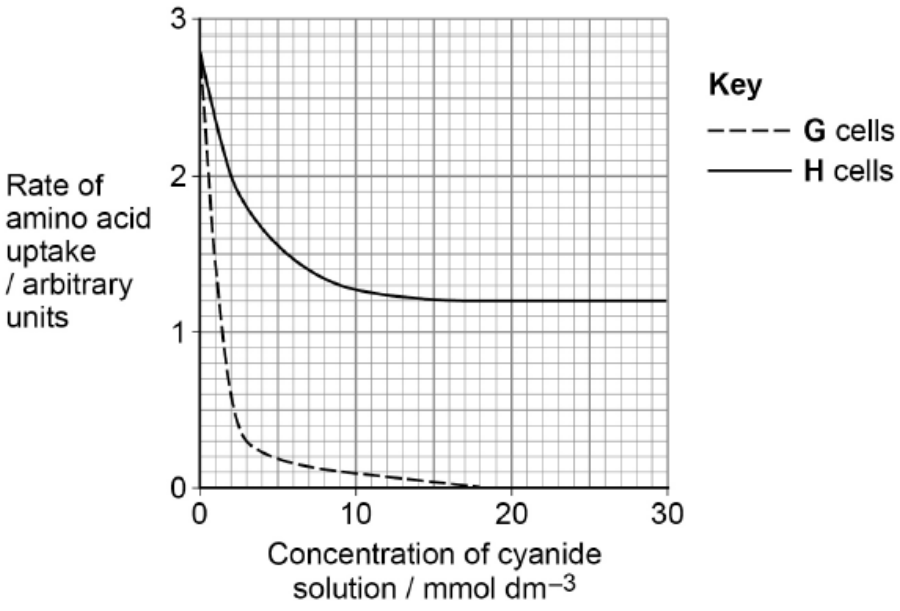
[4 marks]

A scientist investigated the effect of cyanide on the rate of amino acid uptake in two types of *Escherichia coli*, **G** and **H**.

- **G** cells produce enzymes involved in ATP production **only** on their cell-surface membrane.
- **H** cells produce enzymes involved in ATP production on their cell-surface membrane **and** in their cytoplasm.

Figure 8 shows her results.

Figure 8



0 7 . 2 Use **Figure 8** to calculate the percentage decrease in the rate of amino acid absorption by **H** cells in 30 mmol dm^{-3} cyanide solution.

[1 mark]

Answer _____ %

0 7 . 3 Using **Figure 8** and the information provided, what can you conclude about amino acid uptake by **G** cells and by **H** cells?

[3 marks]

4. June/2021/Paper_2/No.9(9.1)

0 9 . 1 Explain **five** properties that make water important for organisms.

[5 marks]