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BIOLOGY

FOUNDATIONS IN BIOLOGY

Level & Board	OCR (A-LEVEL)
TOPIC:	BIOLOGICAL MOLECULES - LIPIDS
PAPER TYPE:	QUESTION PAPER - 1
TOTAL QUESTIONS	07
TOTAL MARKS	/31

Biological Molecules: Lipids - 1

1.

There are three components in triglycerides.

$C_{55}H_{98}O_6$	$C_{18}H_{30}O_{16}$
M	**N**

Two macromolecules have formulas M and N.

(a) Which formula, M or N, corresponds to a triglyceride? Give an explanation for your response. **(2)**

(b) Triglycerides and phospholipid molecules are similar in that they both contain phosphorus as part of a phosphate group.

Describe how phospholipids' structure enables them to create the plasma membrane's bilayer. **(3)**

2.

(a) Glycerol and three fatty acids are joined to form triglycerides.

A glycerol molecule and a fatty acid molecule are depicted in Fig. 18.

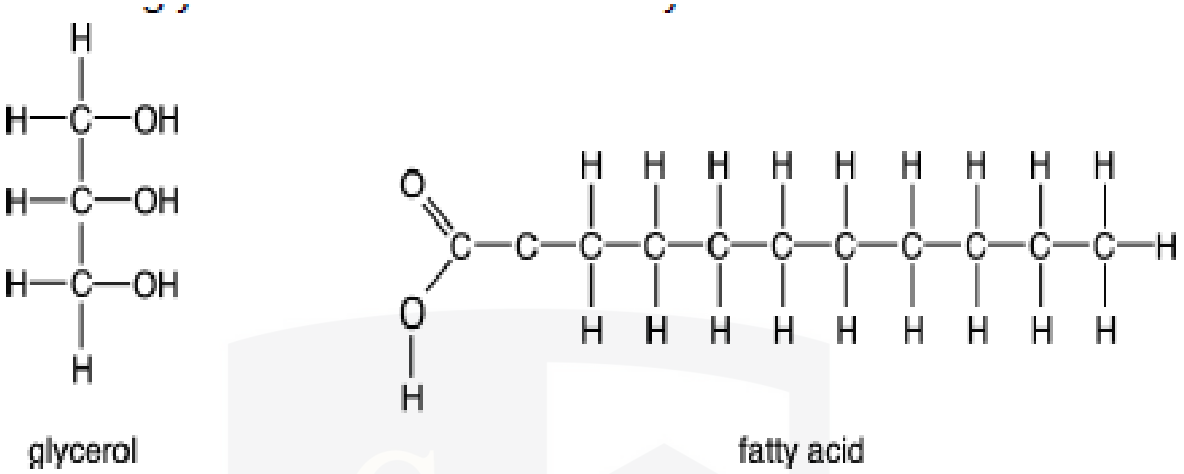


Fig. 18

Draw a molecule of monoglycerides in the area below. **(2)**

(b) Identify the link that the fatty acid and glycerol made. **(2)**

(c) What other molecule does this bond form with? **(2)**

3.

(a) Describe and explain how the various lipid and carbohydrate molecules' structures and characteristics fit them for their function as molecules that stores energy in plants and animals. **(9)**

4.

(a) A triglyceride molecule present in sunflower oil is depicted in Fig. 22.

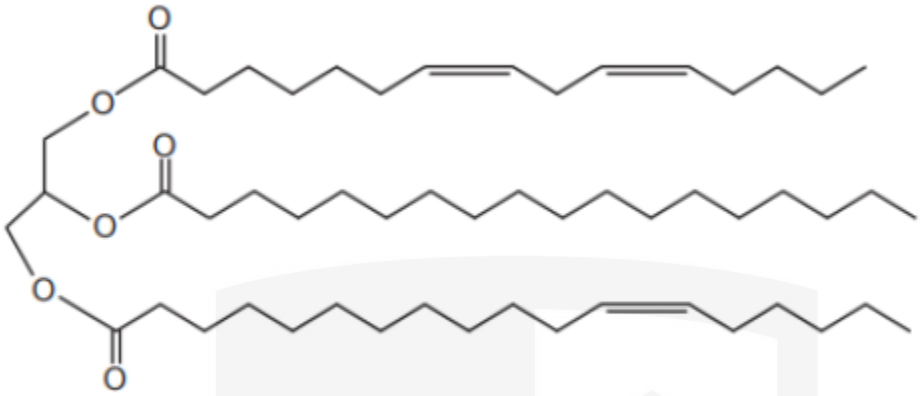


Fig. 22

An ester bond is circled in Fig. 22. **(2)**

(b) Methyl esters are found in biodiesel, which is produced from sunflower oil. Transesterification is the name for the reaction that occurs when methanol and the fatty acids in the triglyceride molecule interact.

Two liquid products are formed after the reaction, and they naturally separate from one another. Over a denser liquid, the methyl esters float.

Identify the portion of the molecule that generates this denser liquid in Figure 22. **(2)**

I am Sorry !!!!!

5.

Triglycerides are used by living things for a variety of purposes, one of which being the synthesis of phospholipids.

(a) List the other three ways that triglycerides are used by living things. **(3)**

(b) The melting temperatures of some of the methyl esters produced by transesterification of the fatty acids found in sunflower oil are displayed in Table 22.

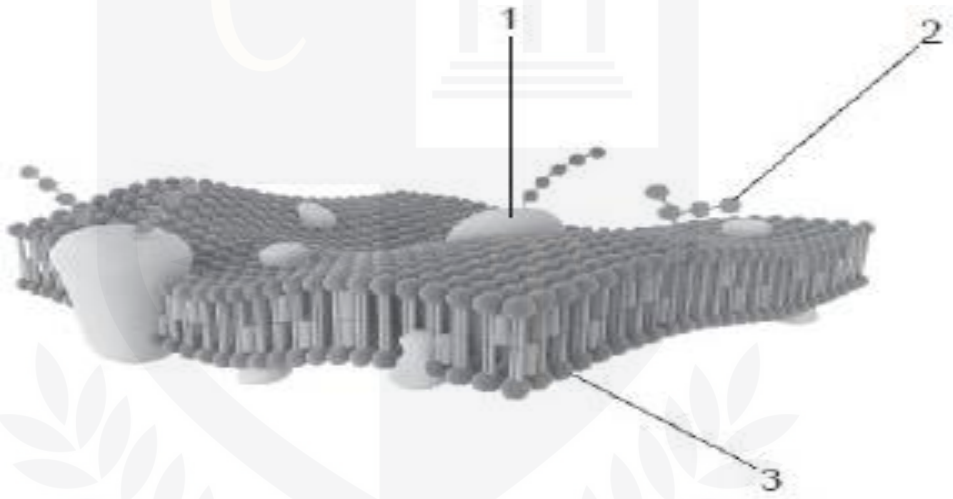
Methyl ester	Formula	Melting point (°C)
Methyl sterate	$C_{19}H_{38}O_2$	39.1
Methyl oleate	$C_{19}H_{36}O_2$	−19.9
Methyl linoleate	$C_{19}H_{34}O_2$	−35.0

Table 22

Give a description and an explanation of the three methyl esters' melting point patterns. **(2)**

6.

An area of a plasma membrane is depicted in the diagram below.



(a) Which label line indicates a possible sulfur atom-containing structure? **(1)**

A 1, 2 and 3 ☐

B Only 1 and 2 ☐

C Only 2 and 3 ☐

D Only 1 ☐

7.

(a) Which of the subsequent procedures results in ester bond formation? **(1)**

1 synthesis of polynucleotides

2 synthesis of triglycerides

3 synthesis of polypeptides

A 1, 2 and 3 ☐

B Only 1 and 2 ☐

C Only 2 and 3 ☐

D Only 1 ☐

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