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BIOLOGY

BIOLOGICAL MOLECULES

LEVEL & BOARD:	AQA (A - LEVEL)
TOPIC:	Lipid
PAPER TYPE:	Solution - 1
TOTAL QUESTIONS	02
TOTAL MARKS	12

Lipids 1

(Solution)

1.

(a) P – glycerol

Q – fatty acid (chains)

(b) Ester bond

(c)

- Add ethanol to the sample, and vigorously shake for one minute.
- Pour the solution into water.
- Next, pour the entire solution into a test tube containing water.
- Check for formation of a milky white emulsion. (Because lipids are insoluble in water, they will become immiscible, meaning they will not mix with the water. As a result, any lipids present in your sample will float to the top and form a milky white emulsion. The greater the concentration of lipids in your sample, the more apparent the milky colour will become).



Fig 1. Test Tube Showing a Positive Emulsion Test for Lipids.

2.

(a) The main structural difference between a phospholipid and a triglyceride is that a phospholipid has a highly polar phosphate head group. Additionally a phospholipid has two fatty acid tails, while a triglyceride has three fatty acid tails.

PHOSPHOLIPID VERSUS TRIGLYCERIDE	
Phospholipid is a lipid composed of a phosphate group attached to a glycerol backbone	Triglyceride is a lipid that is composed of a glycerol backbone attached to three fatty acid chains
Composed of two fatty acid chains	Composed of three fatty acid chains
Composed of a phosphate group attached to the glycerol backbone	Has no phosphate groups attached to the glycerol backbone
Make up the cell membrane of cells	Act as the fat storage in our body
In the formation of a molecule, two water molecules are released as byproducts of each molecule	In the formation of a molecule, three water molecules are released as byproducts of each molecule
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(b) To test for the presence of lipids, you would carry out the emulsion test. To do this, you take the sample and mix it with equal volumes of ethanol and water followed by shaking. A cloudy white emulsion will form if lipids are present. If lipids are absent, no emulsion will form.

(c) Difference Between Saturated Fats and Unsaturated Fats

Saturated Fats	Unsaturated Fats
Contains a single bond.	Contains at least one double bond.
Increases low-density lipoproteins (LDL), which is called as bad cholesterol.	Increases High-density lipoprotein (HDL), which is commonly known as good cholesterol and also reduce low-density lipoproteins (LDL).
Would not spoil quickly.	Spoil quickly.
High melting point.	Low melting point.
Solid state in room temperature.	Liquid state in room temperature

(d)

- It is because fat substitute has wrong shape
- It is unable to fit or bind to active site of lipase that's why it does not form ES complex

(e)

- It is hydrophilic in nature
- It is large polar molecule



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