

Mark schemes

Q1.

- (a) Carboxyl;
Accept carboxylic acid 1
- (b) Type of R group
1. Unsaturated (fatty acid/hydrocarbon);
Explanation
Accept alkene
 2. Double bond (between carbons);
Accept for 'double bond', C=C 2
- (c) 1. Add ethanol/alcohol **then** add water **and** shake/mix
OR
Add ethanol/alcohol **and** shake/mix **then** pour into/add water;
Reject heating the emulsion test
Accept 'Add Sudan III and mix'
Ignore a second shake
2. White/milky (emulsion)
OR
(emulsion) test turns white/milky;
Ignore cloudy
Reject precipitate
Accept (for Sudan III) top (layer) red 2

Q2.

- (a) 1. **One** glycerol and **three** fatty acids;
2. Condensation (reactions) **and** removal of **three** molecules of water;
 3. Ester bond(s) (formed);
Accept all marks in suitably labelled diagram OR in a balanced equation 3
- (b) Palmitoleic acid is an unsaturated fatty acid represented by diagram **K**; 1

Q3.

- (b) 1. Condensation (reaction)

OR

Loss of water;

2. Between of glycerol **and** fatty acid;

Accept labelled diagram

2

Q4.

- (a) P – glycerol

Q – fatty acid (chains)

Accept phonetic spelling

2

- (b) Ester (bond);

1

- (c) 1. (Mix / shake sample) with ethanol, then water;

Sequence is important

2. White / milky (emulsion);

Ignore cloudy

Reject precipitate

2

[5]

Q5.

- (a) 1. Dissolve in alcohol, then add water;

2. White emulsion shows presence of lipid.

2

- (b) Glycerol.

1

- (c) Ester.

1

- (d) **Y** (no mark)

Contains double bond between (adjacent) carbon atoms in hydrocarbon chain.

1

- (e) 1. Divide mass of each lipid by total mass of all lipids (in that type of cell);

2. Multiply answer by 100.

2