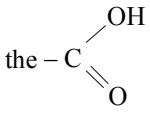
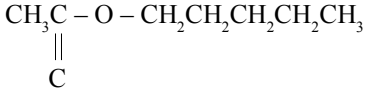
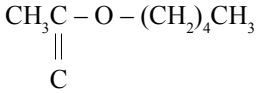
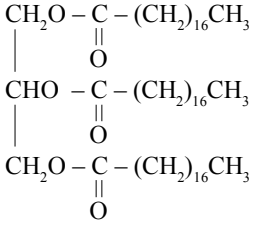
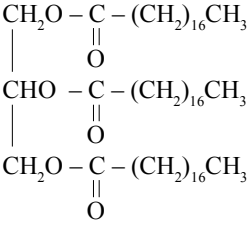
Assessment Schedule – 2005

Science: Describe selected chemical substances and their uses (90730)

Evidence Statement

Q	Achievement	Achievement with Merit	Achievement with Excellence
1(a)(i)	Zig-zag tail = hydrophobic / non-polar **:** SO_3^- head = hydrophilic / polar. **(Correct description of terms is allowed)** BOTH required.		
1(a)(ii)	Anionic.		
1(b)	Hydrophobic / non-polar part of detergent sticks to grease on glass / negative head / hydrophilic head / polar end repelled by negatively charged glass / attracted to water. (Zigzag tail/head only allowed if correctly identified in a diagram or in 1(a)(i).	Hydrophobic / non-polar part of detergent sticks to grease on glass : negative head / hydrophilic head / polar end repelled by negatively charged glass / attracted to water.	Hydrophobic / non-polar part of detergent sticks to grease on glass : negative head / hydrophilic head attracted to water, which is polar, or polar end repelled by negatively charged glass.
1(c)	The positively charged head is attracted to the negatively charged fabric surface / the (non-polar) tail of the detergent molecule sticks out from the fabric / reduces static by balancing (cancelling) charges.	The positively charged head is attracted to the negatively charged fabric surface **:** the non-polar tail / non-charged tail of the detergent molecule sticks out from the fabric : balancing charges.	All THREE parts given in a coherent manner.
2(a)(i)	Circle <u>only</u> around the –OH and the  . BOTH needed.		
2(a)(ii)	(1) Pentanol (2) Butanoic acid BOTH needed.		
2(a)(iii)	 or  All accurate (one omitted H or other minor error allowed).		

Q	Achievement	Achievement with Merit	Achievement with Excellence
2(b)	EITHER Reagent concentrated sulfuric acid (or conc (c) H_2SO_4) : Catalyst / speed up the reaction / removes the water (dehydrator) OR Reagent sodium carbonate / Na_2CO_3 **:** Neutralise excess acid. (Formulae must be correct if no name is used).	EITHER Concentrated sulfuric acid (or conc H_2SO_4) **:** catalyst / speed up the reaction **:** removes water / allowing more ester to be produced (forward reaction). OR Sodium carbonate / (correct formula) **:** neutralise the excess carboxylic acid to remove the unpleasant smell / enhance the pleasant ester smell.	
2(c)	–H comes from the alcohol , –OH comes from the acid.	–H from the –OH of the alcohol. –OH comes from the –OH of the –COOH.	
3(a)	 3 Fatty acid chains	 3 Fatty acid chains plus accurate ester linkage (Minor error / omission allowed.)	
3(b)	HC chain of oil is unsaturated / has C=C bonds **:** HC chain of fat is saturated / only has C–C bonds. (Must compare BOTH.)		
3(c)	Saturated HC chains fit together easily as they have a regular shape (fits more closely, 'packs' together) / unsaturated HC chains don't, as the C=C puts a kink in the chain.	Saturated HC chains fit together easily as have a regular shape : therefore strong intermolecular forces form between the chains / more energy is needed to break them apart : unsaturated HC chains don't as the C=C puts a kink in the chain, the shape is not as regular and the intermolecular (van der Waals) forces between the chains are weaker / less energy is needed to break them apart. (Partly correct for BOTH.)	Saturated HC chains fit together easily as have a regular shape and strong intermolecular forces form between the chains therefore more energy is needed to break them apart / unsaturated HC chains don't as the C=C puts a kink in the chain, the shape is not as regular and the intermolecular forces between the chains are weaker, therefore less energy is needed to break them apart. (Fully correct for BOTH.)
3(d)	Triglycerides from oleic fatty acids are unsaturated / have C=C bonds **:** less chance of heart disease / clogging arteries / less cholesterol.	Triglycerides from oleic fatty acids are unsaturated / have C=C bonds **:** less chance of heart (cardiovascular) problems / disease : less chance of clogging of the arteries / reduces cholesterol.	

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
SIX opportunities answered at Achievement level or higher. 6 × A	EIGHT opportunities answered with at least FOUR at Merit level or higher. 4 × M *plus* 4 × A	EIGHT opportunities answered with at least ONE at Excellence level and FOUR at Merit level. 1 × E *plus* 4 × M *plus* 3 × A