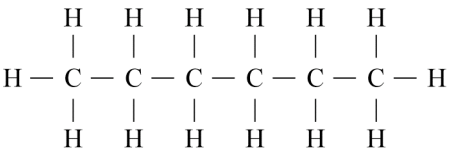
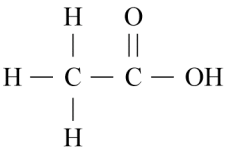
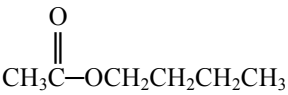
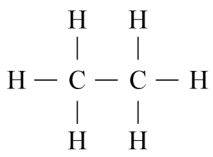
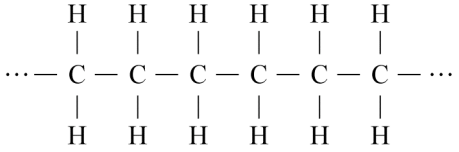
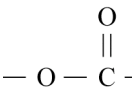
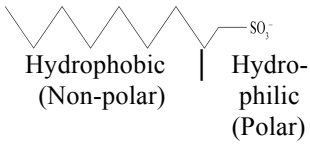
Assessment Schedule – 2007

Science: Describe selected organic compounds and their uses (90730)

Evidence Statement

Question	Achievement	Achievement with Merit	Achievement with Excellence
1(a)(i) to (iv)	(i) $CH_3(CH_2)_4CH_3$  (ii) Propene (iii) CH_3COOH  (iv) Butanol Any ONE correct name AND any ONE correct structure.	All FOUR correct.	
(b)	Butyl ethanoate  (Either correct name or structure.)	Both correct name and structure needed. (Follow through error from 1(a).)	
2(a)(i)	Boiling point.		
(ii)	To vaporise the crude oil / all (except tar) have reached their boiling points.		
(iii)	• So tar (bitumen) can collect at the bottom. • Prevent the crude oil being piped out with the tar (bitumen). • Tar is denser than other fractions in crude oil. One of the above.	• Tar (bitumen) is the first to condense into a liquid so it falls to the lowest level (higher density) for collection. • Tar remains a liquid (does not boil) so sinks to the lowest level (higher density) for collection.	

(iv)	• Molecular sizes in petrol are smaller than those of diesel. • Petrol has a lower boiling point than diesel • Petrol condenses at a lower temperature than diesel • Petrol forms less attractive forces (intermolecular forces) between the carbon chains than diesel. • Petrol has less surface area for intermolecular forces to form, than diesel. One needed.	• Petrol has a lower boiling point than diesel due to the shorter chain lengths. • Petrol condenses at a lower boiling point than diesel because of its shorter chain lengths. • Petrol, having smaller molecules, will have less forces of attraction between the molecules than diesel would. One comparison explained.	As the fuels rise up the column, the diesel will condense first due to the longer chain lengths / greater number of attractive forces between chains, and higher boiling point, while the petrol with its shorter chain lengths / lesser number of attractive forces between chains, will condense further up the column due to its lower boiling point.
(b)	All reactants and products correct but not balanced.	$C_8H_{18} + \mathbf{12.5}O_2 \rightarrow \mathbf{8}CO_2 + \mathbf{9}H_2O$ $\mathbf{2}C_8H_{18} + \mathbf{25}O_2 \rightarrow \mathbf{16}CO_2 + \mathbf{18}H_2O$ (All reactants and products correct and balanced.)	
3(a)	Both name and structural formula correct. Ethane 		
(b)	• Hydrocarbons are non-polar. • Water is polar. • ‘Like compounds will dissolve in like’. One of the above.	• All hydrocarbons are non-polar; they will dissolve in each other as ‘like compounds dissolve in like’. • Hydrocarbons, which are non-polar, will not mix with polar water. One of the above.	All hydrocarbons are non-polar; they will dissolve in each other as ‘like compounds dissolve in like’. Hydrocarbons, which are non-polar, will not mix with polar water.
(c)	• Polymer is a long-chain (carbon compound) made up of many (ethene) units (called monomers) joined together. Or similar statement.		
(d)	 Okay if hexane is drawn.		

4(a)	Circle around ─OOC 		
(b)	Glycerol (glycerine, triol, propan-1,2,3 triol) and **fatty** acids. (Both needed).		
(c)	• The oil has double **carbon to carbon (C=C)** bonds. • Triglyceride is polyunsaturated. One of the above.	• The oil has double carbon to carbon (C=C) bonds making it a liquid at room temperature. • Presence of C=C bonds lowers the melting point. • The irregular shape (kinks) lowers the melting point. One of the above.	Presence of several double **carbon to carbon (C=C) bonds** results in the compound having an **irregular shape**. Due to the shape other compounds cannot fit together with it easily, thus **lowering the melting point** making the triglyceride a liquid at room temperature.
(d)			
(e)	• Hydrophobic (non-polar) end of detergent attracted to fat or oil. • Hydrophilic (polar) end dissolves in the water. • Detergent molecules form micelles ONE of the above.	**Explanation (can be from an annotated diagram)** • Hydrophobic (non-polar) end of detergent attracted to fat or oil. • Hydrophilic (polar) end dissolves in the (polar) water. • Fat or oil lifted off. ALL points required.	**Discussion (can be from a fully annotated diagram)** • Hydrophobic (non-polar) end of detergent attracted to fat or oil. • Hydrophilic / polar end dissolves in the (polar) water. • Micelles form which interact (as outlined by bullet points above) to cause fats and oils to be removed. ALL points required.

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
SEVEN opportunities answered at Achievement level or higher 7 × A	TEN opportunities answered with at least FIVE at Merit level or higher. 5 × M + 5 × A	ELEVEN opportunities answered with at least TWO at Excellence level and FOUR at Merit level or higher. 2 × E + 4 × M + 5 × A