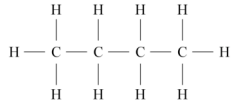
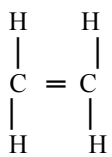
Assessment Schedule – 2006 version 2.

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

Evidence Statement

Q	Achievement	Achievement with Merit	Achievement with Excellence
1a(i)	Accurate  **OR** $CH_3CH_2CH_2CH_3$		
1a(ii)	CO_2 **:** H_2O (**OR** words).		
1(a)(iii)	Equation shows soot (**carbon**) but is not balanced (could have equation with C + CO).	$C_3H_8 + 2O_2 \rightarrow 3C + 4H_2O$ (could have accurate equation with C and CO).	
1(a)(iv)	One of the following and answers must mention carbon monoxide or CO. • Carbon monoxide is produced (in a poorly ventilated room). • To avoid being poisoned by carbon monoxide. • A well ventilated room has plenty of oxygen which means that less CO is produced.	A well ventilated room provides oxygen, which means that propane or LPG is completely combusted or burnt to carbon dioxide. Therefore carbon monoxide is not produced. Answer is supported by accurate symbol equation, which may not be balanced, for the incomplete combustion of propane or butane to CO. An unbalanced equation using methane is acceptable.	Bunsen burners burn with reduced oxygen, releasing carbon monoxide which is a poisonous gas **:** room needs to be well ventilated to completely combust propane or LPG to carbon dioxide **:** carbon monoxide cannot accumulate. Answer is supported by an accurate balanced symbol equation for the incomplete combustion of propane or butane to CO. A balanced equation using methane is acceptable.
1(b)	As the size of the alkane increases, the energy released also increases. (Can relate answer to propane and butane).	As the number of carbons of the alkane chain increases, the energy released also increases **:** energy is released each time a (C – C) bond is broken.	
2(a)(i)	Ethene 		
2(a)(ii)	Circle around the double bond. (Also allow circle around =).		
2(b)	Weak forces (bonds) **OR** intermolecular forces **OR** van der Waal forces between the chains.	Weak forces (bonds) **OR** intermolecular forces **OR** van der Waal forces between the chains so that the longer the chain the greater the number of such forces. Therefore the greater the strength. Because a long chain results in a larger surface area which gives more strength.	

3(a)	Water and alcohol are polar **OR** hydrogen bonds form between water and alcohol **OR** alcohol functional group (OH) is hydrophilic **OR** alcohol HC chain is hydrophobic **OR** bonding to cause solubility is between the alcohol functional group and water.	Alcohols and water are both polar **OR** form hydrogen bonds. **AND** Smaller alcohols are not effected by short non-polar hydrocarbon chain, making them soluble. **OR** Larger alcohols have a longer hydrocarbon chain that reduces the polar –OH group, making them insoluble.	Alcohols and water are both polar. **AND** Smaller alcohols are able to dissolve in water because hydrogen bonds are easily made between them (the broken H-bonds between water molecules and between alcohol molecules are compensated by the H-bonds formed when water bonds to alcohol). Larger alcohols have a longer HC chain, which reduces the overall number and effectiveness of the hydrogen bonds (due to weaker van der Waals bonds forming) leading to a reduction in solubility.
3(b)(i)	Orange to green or blue.		
3(b)(ii)	Methanoic acid / HCOOH.		
3(c)	**ONE** of: • Hexyl methanoate and water • $HCOO(CH_2)_5CH_3$ and H_2O • Hexyl methanoate and water and $HCOO(CH_2)_5CH_3$ and H_2O with one error in symbols • ester name and formula correct.	Hexyl methanoate and water and structures drawn for $HCOO(CH_2)_5CH_3$ and H_2O – are all accurate.	
3(d)	**ONE** advantage **OR** disadvantage, eg: **Advantages** • Methanol is cleaner burning than diesel. • Methanol releases less carbon monoxide. • Methanol is safer than petrol as it burns at a cooler temperature. **Disadvantages** • Methanol doesn't produce as much energy because it is a smaller molecule. • Methanol needs to be more refined than diesel to use as a fuel.	One advantage **AND** disadvantage.	
4(a)	ONE of • Fat has longer fatty acid chain. • Hydrocarbon chains in fats are saturated or have single C–C bonds. • Hydrocarbon chains in oils are unsaturated or have double C=C bonds.		
4(b)	The degree of unsaturation **OR** the number of C=C		

4(c)	**ONE** of: • More saturation or less C=C in coconut. • Very low unsaturation. • Solid at room temperature.	**ONE** of: • More saturation or less C=C in coconut which means it is a solid at room temperature, or more solid than beef or mutton fat. • More saturation or less C=C in coconut which means that it could cause clogging of the arteries or heart disease.	Comparison must be made between coconut and oil with a high iodine number, eg: More saturation or less C=C in coconut which means it is solid at room temperature, or more solid than beef or mutton fat. This also means that it could cause heart disease. This is not as healthy as other oils, such as soyabean oil, which are unsaturated and protect against heart disease.

Judgement Statement

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

Achievement	Achievement with Merit	Achievement with Excellence
SEVEN questions answered correctly. Minimum of 7 × A	EIGHT questions answered correctly, including at least FOUR at Merit level.	NINE questions answered correctly, including at least ONE at Excellence and at least FOUR at Merit level. Minimum of 1 × E + 4 × M + 4 × A