Organic test Solutions

Multiple choice

1. C

**2**. D methanoic acid

**3**. B H- O - = hydroxyl.. –NH2 = amine, COOH = carboxyl

4. C The CnH2n+2 formula will be the same as for an alkane, as the alkanol has the same number

 of hydrogen atoms.

**5**. A Propane is lower boiling point than the longer butane which will be lower boiling point

 than the alkanol that has hydrogen bonding.

**6**. D This is a standard substitution onto an alkane, forming chlorobutane from butane, then

 butanol.



**7**. D

**8**. D



**9**. A

****

**10. B**

**Section B**

Question 1

**a**.

Molecule A\*

Substance B KCl \*

2 marks

**b**. **i**.

\*



 **ii**.

\*

 **iii**. some 1-propanol is oxidized to propanoic acid, using Cr2O72- in acid\*\*





Remaining 1-propanol is reacted with propanoic acid using sulfuric acid as a catalyst to form propylpropanoate \*\*

1 + 1 + 4 = 6 marks

**c**.

 Name: oct-1-ene \* Formula: C8H16 \*

 2 marks

Total 10 marks

**Question 2** (7 marks)

**a**. You show the 1- when there is more than one possible structure for the molecule\*. Propanol

 needs the 1 but propanoic acid does not as the acid group can only be on the end of the

 molecule\*

2 marks

**b**. **i**. Numbering should start from the right hand end of this molecule, making it 2-methylpentane\*

 **ii**. No, it is an isomer of hexane as it has 6 carbons \*

1 + 1 = 2 marks

**c**. **i**. 2-propanol and 1-propanol\*\*

 **ii**. primary alcohol has the –O-H on the end of the molecule. A secondary alcohol has the –O-H

 as part of a hydrocarbon chain.

2 + 1 = 3 marks

Total 7 marks

**Question 3**



**a. i**. Name this molecule ethyl butanoate \*

 **ii**. see diagram \* Name: ester \*

1 + 1 = 2 marks

**b**. **i**. How many different hydrogen environments does this molecule have? 5 \*

 **ii**. How many different carbon environments does it have? 6 \*

1 + 1 = 2 marks

**c**. **i**.

 Molecule 1:ethanol \* Molecule 2: butanoic acid \*

 **ii**. H2O \*

 **iii**. C2H6O(l) + C4H8O2(l) 🡪 C6H12O2(aq) + H2O(l) \*

2 + 1 + 1 = 4 marks

Total 8 marks

**Question 4** (8 marks)

**a. i**. Molecules with the same molecular formula but different spatial arrangement of the atoms.

 **ii.** 4



 **iii**.

 1 + 1 + 2 = 4 marks

**b**.

 2 marks

**c**. **i**. An atom that has 4 different groups attached to it.

 **ii**.



 1 + 1 = 2 marks

**Question 5**  (7 marks)

a.  **i**.

 **ii**. 

 **iii**.

 1 + 2 + 2 = 5marks

b.



 2 marks