Section A

1. Choose which of these is an alcohol.

   Tick (✓) **one** box.

   A. Ethane ☐

   B. Ethene ☐

   C. Ethanol ☐

2. Choose the function groups of the alcohols.

   Tick (✓) **one** box.

   A. Hydroxyl group ☐

   B. Hydroxide group ☐

   C. Hydrogen group ☐

3. Complete the structural formula for propanol:

   C   C   C

4. The alcohols are a large family of compounds.
   Determine the chemical formula of an alcohol with:
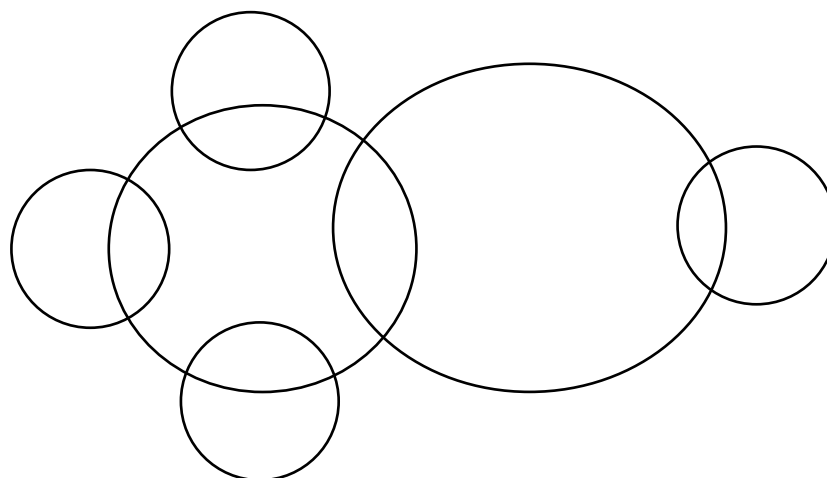   a. 6 carbons

   _____

   b. 8 carbons

   _____

   c. 10 carbons

   _____

Section B

5. Methanol is an alcohol.
   a. Complete the dot and cross diagram to show the bonding in methanol.

   b. Give a use for methanol.

   _____
   _____

   c. Complete the word equation to show the complete combustion of methanol.

   Methanol + oxygen → _____ + _____

   d. Compare the products that would be produced through complete and incomplete combustion of methanol.

   _____
   _____
   _____
   _____

   e. Predict the products of the following reactions.

      i.   Ethanol + sodium →
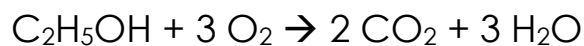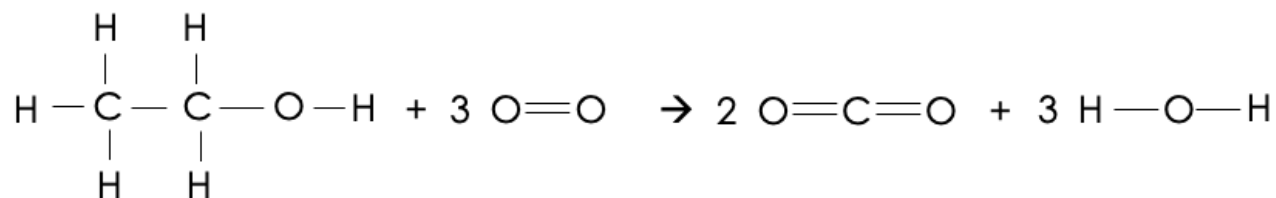
      ii.   Propanol + sodium →

      iii. Butanol + sodium →

6. *This question is for higher tier students.*
   Ethanol burns completely in air according to the following equation:

$C_2H_5OH + 3 O_2 \rightarrow 2 CO_2 + 3 H_2O$

This reaction can be represented with structural formulae:

$$H-\underset{\underset{H}{|}}{\overset{\overset{H}{|}}{C}}-\underset{\underset{H}{|}}{\overset{\overset{H}{|}}{C}}-O-H + 3\ O{=}O \rightarrow 2\ O{=}C{=}O + 3\ H-O-H$$

a. Use the bond energies given in the table to calculate the overall energy change of this reaction.

Bond	Bond energy (kJ/mol)
C-C	347
C-H	413
C-O	358
C=O	799
O-H	467
O=O	495

_____
_____
_____
_____
_____
_____
_____
_____
_____

b. Use your answer to explain whether this reaction is exothermic or endothermic.

_____
_____
_____
_____

Section C

7. Ethanol is an alcohol.
   a. State the chemical formula of ethanol.

b. Draw the structural formula of ethanol.
c. One use of ethanol is in alcoholic drinks. Give another use of ethanol.
d. Describe some of the short term effects of alcohol on the body.
e. Describe a simple experiment that could be used to estimate a person's reaction time.
f. Drinking alcohol affects the stopping distance of a car. Does this affect the thinking distance or the braking distance?
g. Calculate the stopping distance of a car travelling at 10 m/s with a deceleration of 2.5 m/s^2. The diver's reaction time is 0.4 seconds.