Section A

1. Complete the word equation for hydration of ethene.

   Ethene + _____ → _____

2. What is the chemical formula of ethene?
   Tick (✓) **one** box.

   A. C_2H_6 ☐

   B. C_2H_5 ☐

   C. C_2H_4 ☐

3. Choose the required temperature for hydration of ethene to take place.

   Tick (✓) **one** box.

   A. 100 °C ☐

   B. 300 °C ☐

   C. 600 °C ☐

4. Complete the structural formula for ethene:

   C C

5. Compare the structure of ethene and ethanol.

_____
_____
_____
_____
_____
_____

Section B

6. Describe the steps involved in the production of ethanol from crude oil.

7. E5 and E10 are both types of fuel used in cars. They both contain petrol and ethanol in different quantities. The table below shows some information about each fuel type.

Fuel type	**% of ethanol**	**% of petrol**
E5	5	95
E10	10	90

a. When filled, a car tank can hold 42 kg of E5 fuel. Calculate the mass of ethanol that would be found in 42 kg of E5 fuel.

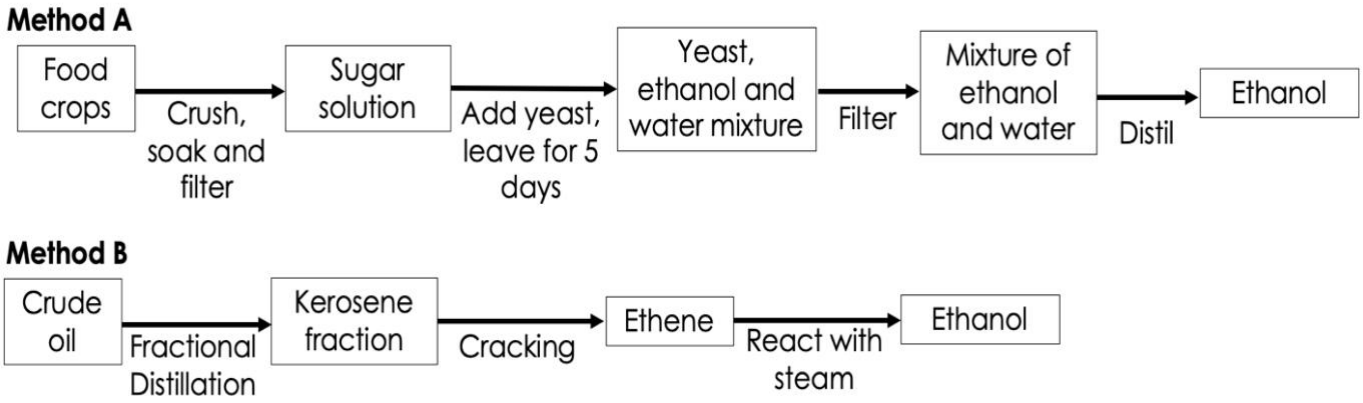
b. The ethanol used in both these fuel types is made from sugar cane plants.
Suggest why E10 fuel is considered to be more environmentally friendly than E5 fuel.

c. When ethanol is burned, it releases 28 MJ of energy per kg of ethanol. When petrol is burned, it releases 45 MJ of energy per kg of petrol.

Use this information to suggest one advantage of using E5 fuel instead of E10 fuel.

d. Explain whether burning petrol and ethanol are exothermic or endothermic reactions.

8. The flowcharts below show information about two different methods of producing ethanol.



Use information from the flow charts and your own knowledge to evaluate the two methods of producing ethanol.

Section C

9. Another use of ethanol is in antibacterial hand gels. This can help to prevent the spread of communicable diseases.
   a. Define a communicable disease.
   b. Give an example of a communicable disease.
   c. Describe other methods of preventing the spread of communicable diseases.