Science Mastery

Section A

1. Choose the correct words from the box to complete the sentences.

compound	**mixture**	**hydrocarbons**	**mud**	**plankton**	**rocks**	**finite**	**infinite**

Crude oil is a _____ resource found deep underground. It is made from the biomass of ancient _____, which was buried under _____.

2. Choose the correct definition of a hydrocarbon.

   Tick (✓) **one** box.

   A. A compound made of hydrogen and carbon atoms ☐

   B. A compound made of water and carbon atoms ☐

   C. A mixture made of hydrogen and carbon atoms ☐

   D. A mixture made of water and carbon atoms ☐

3. State the general formula of the alkanes.

   _____

4. Choose the name of the alkane that contains three carbon atoms.

   Tick (✓) **one** box.

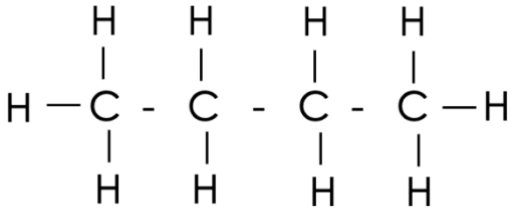
   A. Ethane ☐

   B. Propane ☐

   C. Butane ☐

5. Name the alkane shown by the structural formula below.

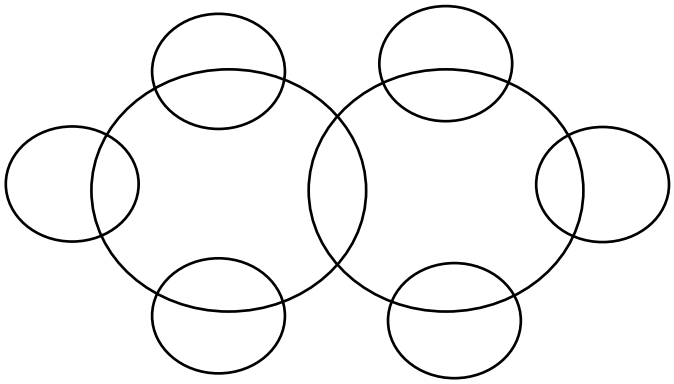
   _____



Section B

6. Methane and ethane are both alkanes.
   a. Draw the structural formulae for methane and ethane.

   b. Complete the dot and cross diagram to show the bonding in a molecule of ethane.



   c. Compare the structures of methane and ethane.

_____
_____
_____
_____
_____

   d. The alkanes is a large family of compounds.
      Determine the chemical formula of an alkane with:
      i. 8 carbons

      _____

      ii. 24 carbons

      _____

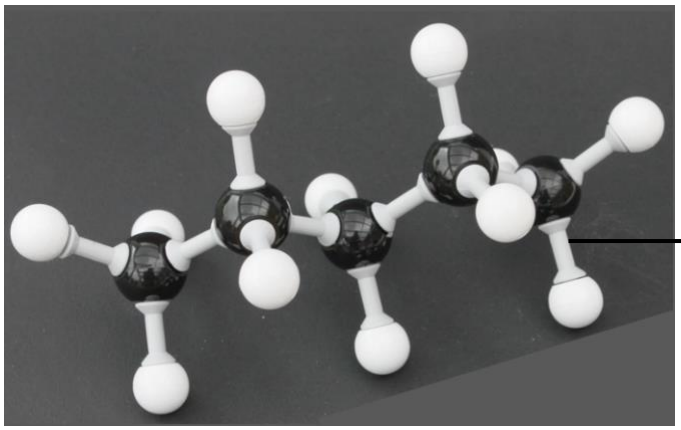
      iii. 36 hydrogens

      _____

iv. 20 hydrogens

_____

7. The image below shows a model of an alkane.



a. Determine the chemical formula of this alkane.

_____

b. Give an advantage of this model.

_____

_____

c. What is represented by the letter A?

_____

d. Explain why this alkane is a compound and a molecule.

_____

_____

_____

_____

Section C

8. Carbon has an atomic number of 6 and a mass number of 12.

a. State the number of protons, neutrons and electrons in an atom of carbon.

b. Draw the electronic configuration of a carbon atom.
c. Explain why a carbon atom is neutral.
d. Carbon's mass number is usually rounded to 12 but the relative atomic mass is actually 12.02. Explain why this is not a whole number.
e. Compare the atomic structures of carbon-12 and carbon-14.