Paper 3

Questions are applicable for both core and extended candidates

1 (b) Fig. 2.2 shows a fractionating column for separating petroleum into different hydrocarbon fractions.

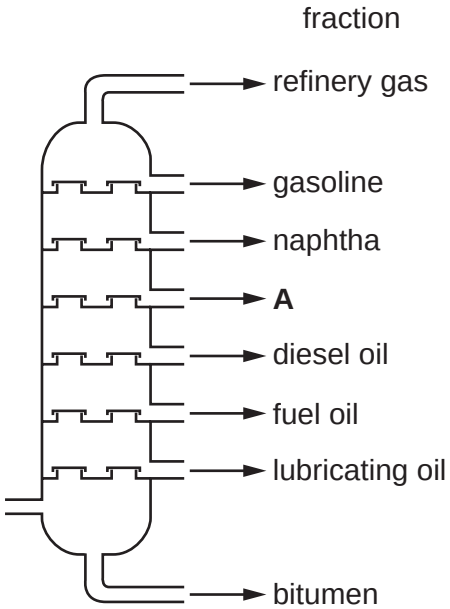


Fig. 2.2

(i) On Fig. 2.2, draw an **X** inside the column to show where the hydrocarbon with the highest viscosity collects. [1]

(ii) Name the fraction labelled **A** in Fig. 2.2.

..... [1]

(iii) State the name of the fraction in Fig. 2.2 which has the lowest boiling point.

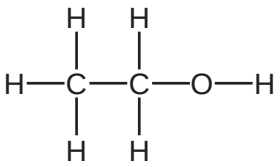
..... [1]

(iv) State **one** use of the bitumen fraction.

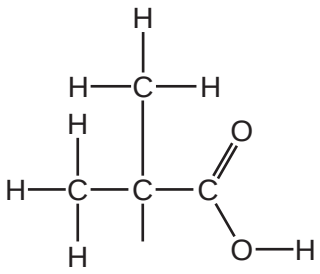
..... [1]

2 The structures of four organic compounds, **P**, **Q**, **R** and **S**, are shown.

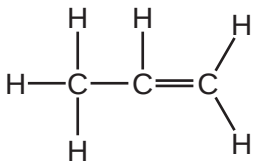
P



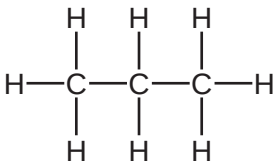
Q



R



S



(b) Structure **S** is produced by cracking petroleum fractions.

(i) Complete the sentence using a word from the list.

acids **alkenes** **alcohols** **nitrogen**

During cracking, long-chain alkanes are converted to shorter chain alkanes and ..... . [1]

(ii) Cracking is an example of thermal decomposition.

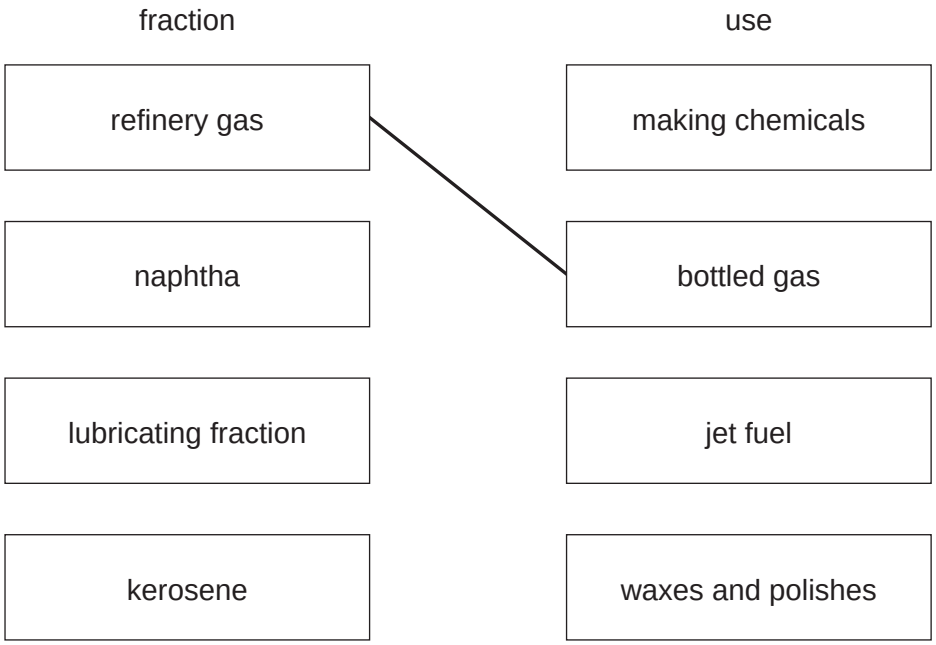
State the meaning of the term *thermal decomposition*.

.....

..... [2]

(c) Link each petroleum fraction on the left to its use on the right.

The first one has been done for you.



[2]

3 **(a)** A list of symbols and formulae is shown.

CaO
CH_4
C_2H_4
C_2H_6
Cl^-
Cu^{2+}
H_2
He
K^+
N_2
Na^+
SO_2

Answer the following questions using these symbols or formulae.
Each symbol or formula may be used once, more than once or not at all.

State which symbol or formula represents:

(iii) an element used as a fuel

..... [1]

4 **(b)** Petroleum is a mixture of hydrocarbons which can be separated into fractions with different boiling points.

Name the method used to separate these fractions.

..... [1]

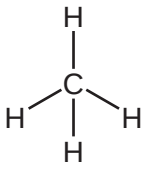
(c) Complete the table to show the name and uses of some petroleum fractions.

name of fraction	use of fraction
refinery gas	
gasoline	
	waxes and polishes

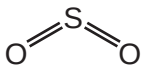
[3]

5 The structures of seven compounds, **A**, **B**, **C**, **D**, **E**, **F** and **G**, are shown.

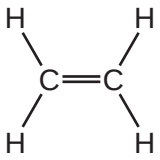
A



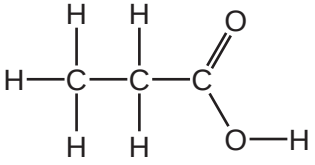
B



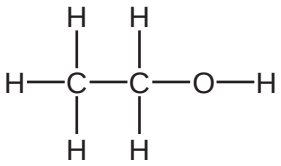
C



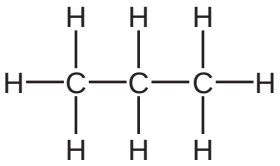
D



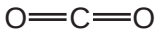
E



F



G



Answer the following questions about these structures.
Each structure may be used once, more than once or not at all.

(a) State which structure, **A**, **B**, **C**, **D**, **E**, **F** or **G**, represents:

(v) a compound that is the main constituent of natural gas.

..... [1]

Paper 4

Questions are applicable for both core and extended candidates unless indicated in the question

6 A list of substances is shown.

aluminium oxide	**carbon dioxide**	**chlorine**	**diamond**	**ethanol**
glucose	**iron(III) oxide**	**limestone**	**nitrogen**	**oxygen**

Answer the questions using the list of substances.

Each substance may be used once, more than once or not at all.

State which of the substances:

(d) is used as a fuel

..... [1]