

QUESTIONSHEET 1

(a)	Any three from: bodies of sea creatures that died millions of years ago decayed anaerobically under high temperature and pressure	3
(b) (i)	compounds with different numbers of carbon atoms have different boiling points heating vaporises crude oil different compounds condense at different temperatures	3
(ii)	gasoline	1
(iii)	naphtha	1
(c)	compounds containing <u>only</u> the elements carbon & hydrogen	1 1
		TOTAL 10

QUESTIONSHEET 2

(a) (i)	distillation	1
(ii)	contains oil/stop oil running about/safety	1
(b)	very high dark yellow does not burn	1 1 1
(c) (i)	A Any two from low b.p./volatile easy to burn clean flame	1 2
(ii)	C high viscosity	1 1
		TOTAL 10

QUESTIONSHEET 3

- (a) a compound containing carbon & hydrogen only 1
1
- (b) Any two from:
compounds have same general formula
physical properties show gradation
chemical properties are similar 2
- (c) C_6H_{14} 1
- (d) (i)
- $$\begin{array}{cccc}
 & H & H & H & H \\
 & | & | & | & | \\
 H & - C & - C & - C & - C - H \\
 & | & | & | & | \\
 & H & H & H & H
 \end{array}$$

$$\begin{array}{ccccc}
 & & H & & \\
 & & | & & \\
 & H & - C & - H & \\
 & & | & & \\
 H & - C & - C & - C & - H \\
 & | & | & | & \\
 & H & H & H &
 \end{array}$$
- 2
- (ii) straight chain version 1
- (iii) Any two from:
has greatest contact with neighbouring molecules
therefore greater intermolecular forces of attraction
greater forces mean more energy/heat needed to separate molecules 2

TOTAL 10**QUESTIONSHEET 4**

- (a) fractional distillation 1
- (b) cracking 1
- (c) polymerisation 1
- (d)
- $$\left[\begin{array}{cc}
 H & H \\
 | & | \\
 - C & - C - \\
 | & | \\
 H & H
 \end{array} \right]_n$$

single bond 1

indication of long chain 1
- (e) non-biodegradable/stays in ground for a long time 1
toxic fumes when burnt 1

TOTAL 7

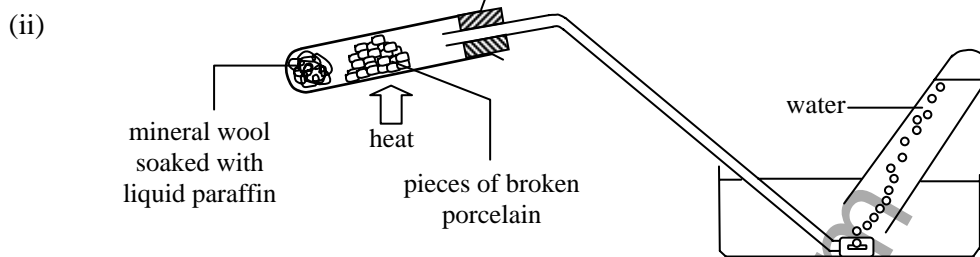
QUESTIONSHEET 5

- (a) contains carbon – carbon double bond 1
- (b) C_nH_{2n} 1
- (c) Any two from:
300°C/raised temperature/heat
60 atmospheres/high pressure
phosphoric acid/catalyst 2
- (d)
- $$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{H}-\text{C}-\text{C}-\text{OH} \\ | \quad | \\ \text{H} \quad \text{H} \end{array}$$
- 1
- (e) shake each gas with bromine water 1
bromine loses colour with ethene/not with ethane 1
- (f)
- $$\begin{array}{cccc} \text{Cl} & \text{H} & \text{Cl} & \text{H} \\ | & | & | & | \\ -\text{C} & -\text{C} & -\text{C} & -\text{C}- \\ | & | & | & | \\ \text{H} & \text{H} & \text{H} & \text{H} \end{array}$$
- 2

TOTAL 9

QUESTIONSHEET 6

- (a) (i) high temperature
named catalyst
(aluminium oxide/silicon dioxide/broken pot) 1
1



- liquid paraffin in mineral wool 1
catalyst 1
heat 1
collection over water 1

- (iii) product is gas, starting material is liquid 1

- (b) saturated have only carbon-carbon single bonds 1
unsaturated have at least one carbon-carbon double bond 1

TOTAL 9

QUESTIONSHEET 7

- (a) (i)
$$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{H} - \text{C} - \text{C} - \text{H} \\ | \quad | \\ \text{H} \quad \text{H} \end{array}$$
 1
- (ii) has only carbon-carbon single bonds 1
- (iii) needs a double bond to form polymers 1
- (b) (i)
$$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \\ | \quad | \quad | \quad | \\ \text{H} - \text{C} = \text{C} - \text{C} - \text{C} - \text{H} \\ | \quad | \\ \text{H} \quad \text{H} \end{array} \quad \text{or} \quad \begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \\ | \quad | \quad | \quad | \\ \text{H} - \text{C} - \text{C} = \text{C} - \text{C} - \text{H} \\ | \quad | \\ \text{H} \quad \text{H} \end{array}$$
 1
- (ii)
$$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \\ | \quad | \quad | \quad | \\ \text{---} \text{C} - \text{C} - \text{C} - \text{C} \text{---} \\ | \quad | \quad | \quad | \\ \text{H} \quad \text{C}_2\text{H}_5 \quad \text{H} \quad \text{C}_2\text{H}_5 \end{array} \quad \text{or} \quad \begin{array}{c} \text{CH}_3 \quad \text{CH}_3 \quad \text{CH}_3 \quad \text{CH}_3 \\ | \quad | \quad | \quad | \\ \text{---} \text{C} - \text{C} - \text{C} - \text{C} \text{---} \\ | \quad | \quad | \quad | \\ \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \end{array}$$
 1
- (c) (i) cups/electrical fittings/kettles 1
- (ii) heat sample of the plastic 1
if it melts it is thermoplastic 1
if it chars it is thermosetting 1

TOTAL 9**QUESTIONSHEET 8**

- (a) (i) 1,2-dibromoethane 1
(ii) hydrogen 1
(iii) nickel/platinum 1
(iv) phosphoric acid/sulphuric acid 1
(v) poly(ethene) /polythene 1
(vi) ethanol 1
- (b) $\text{C}_2\text{H}_4 + \text{H}_2\text{O} \rightarrow \text{C}_2\text{H}_5\text{OH}$ 2
- (c) making margarine 1

TOTAL 9

QUESTIONSHEET 9

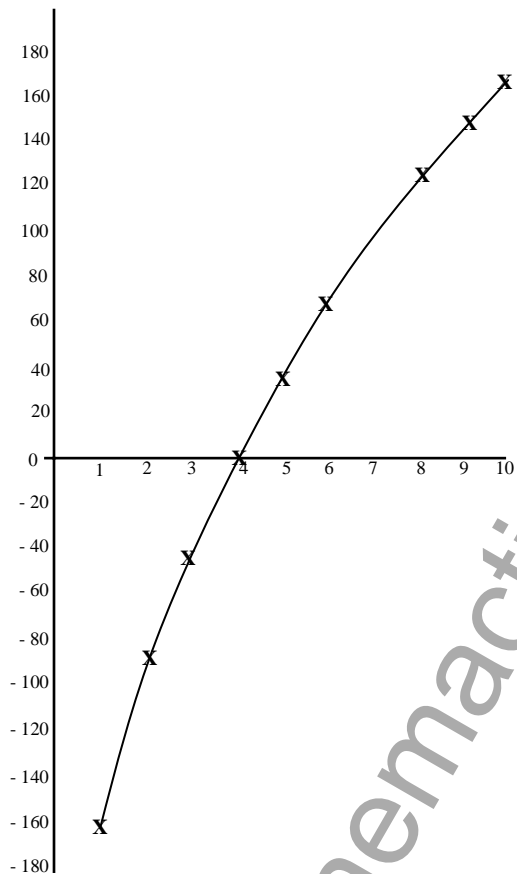
(a) (i) pentane

1

(ii) C_8H_{18}

1

(b) (i)



sensible scales

1

axes labelled + units

1

points plotted correctly

1

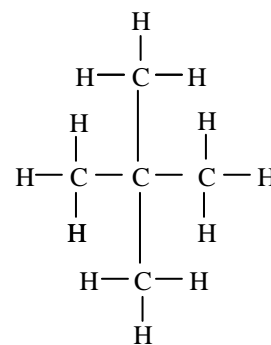
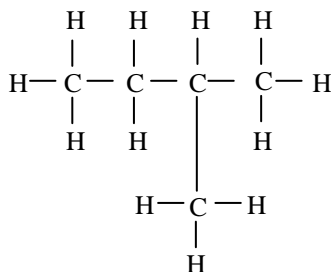
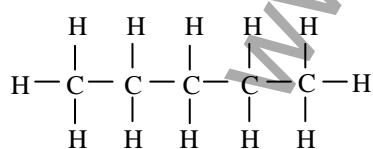
smooth curve drawn through points

1

(ii) 99°C ($\pm 1^\circ\text{C}$)

1

(c)



3

TOTAL 10

QUESTIONSHEET 10



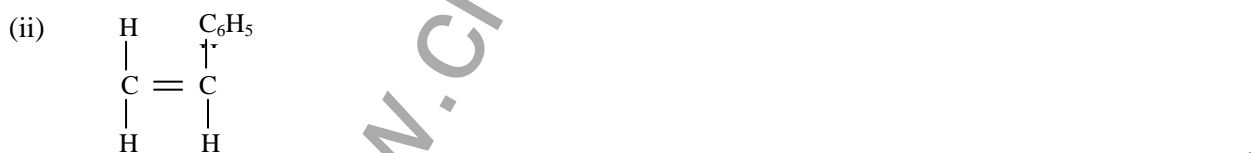
(c) it is light/low density 1
strong 1

(d) poly(ethene) is stronger than paper 1
can be mass produced/ethene is now readily available 1

TOTAL 8

QUESTIONSHEET 11

(a) (i) poly(phenylethene) 1



(b) double bond 1

(c) (i) flexible 1
electrical insulator 1

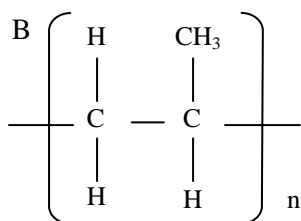
(ii) rubber perishes/cracks in time 1
poly(chloroethene) is fire-resistant 1

(d) non-biodegradable 1
toxic fumes when burned 1

TOTAL 9

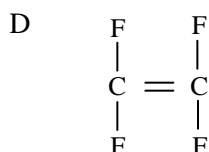
QUESTIONSHEET 12

(a) A poly(propene) 1



1

C tetrafluoroethene 1



1

(b) the simplest compound from which a polymer is made 1

(c) a molecule/compound made by joining thousands of monomers 2

(d) C₂F₄ 1

(e) it does not rust/lighter/lower density 1

TOTAL 9**QUESTIONSHEET 13**

(a) alkanes 1

(b) ethene and propene 2

(c) (i) C₈H₁₈ 1

(ii) octane 1

(d) Two from:
makes use of less useful fractions
produces more petrol
produces alkenes/raw materials for the petrochemical industry 2

(e) Two from:
poly(ethene)
ethanol
bromoethane
ethane-1, 2-diol 2

TOTAL 9

QUESTIONSHEET 14

- (a) water 1
- (b) turn cloudy/milky 1
- (c) (i) carbon 1
- (ii) incomplete combustion 1
- (iii) carbon monoxide 1

TOTAL 5

QUESTIONSHEET 15

- (a) $C_2H_4 + H_2O \rightarrow C_2H_5OH$ 2
- (b) (i) oxygen 1
- (ii) $C_3H_7 - \underset{\begin{array}{c} || \\ O \end{array}}{C} - O - CH_3$ 1
- (iii) **For** Two from:
help to preserve food
help food processing
attractive colours 2
- Against** Two from:
can have side effects
lack of consumer choice
can lead to bad food being sold 2
- (c) (i) sugar cane needs warm climate to grow 1
Brazil's climate is more suitable than Britain's 1
- (ii) people may drink it 1
- (d) solvent 1

TOTAL 12

QUESTIONSHEET 16

- (a)
- | | |
|---|---|
| $ \begin{array}{cccccccc} & \text{H} & & \text{H} & & \text{H} & & \text{H} \\ & & & & & & & \\ \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & & \\ & \text{H} & & \text{H} & & \text{H} & & \text{H} \end{array} $ | 1 |
| C_5H_{12} | 1 |
| C_6H_{14} | 1 |
| $ \begin{array}{cccccccccc} & \text{H} & & \text{H} & & \text{H} & & \text{H} & & \text{H} & & \text{H} \\ & & & & & & & & & & & \\ \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - & \text{C} & - & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & & & & & & \\ & \text{H} & & \text{H} & & \text{H} & & \text{H} & & \text{H} & & \text{H} \end{array} $ | 1 |
| (b) keep it cool | 1 |
| keep away from flames & sparks | 1 |
| (c) they would tend to boil off together | 1 |

TOTAL 7**QUESTIONSHEET 17**

- | | |
|---------------------------|---|
| (a) (i) 13% ($\pm 2\%$) | 1 |
| (ii) 16% ($\pm 3\%$) | 1 |
| (iii) 24% ($\pm 3\%$) | 1 |
| (b) liquid | 1 |
| (c) 11% | 1 |

TOTAL 5

QUESTIONSHEET 18

(a)	(i)	a substance which helps in cleaning processes	1
	(ii)	Two from: if not, will stay in water causing rivers to foam harming aquatic life	2
(b)	(i)	chromatography	1
	(ii)	ink would run in solvent	1
	(iii)	yellow	1
	(iv)	orange	1
			TOTAL 7

QUESTIONSHEET 19

(a)		guttering – easily moulded	1
		carrier bags – can be coloured or lightweight	1
		combs – easily moulded	1
		sandwich bags – non-toxic	1
(b)	(i)	jet aeroplane fuel	1
	(ii)	petrol	1
	(iii)	petroleum gas	1
			TOTAL 7

QUESTIONSHEET 20

(a)		C & D (both)	1
(b)	(i)	produces carbon dioxide may produce toxic gases	1 1
	(ii)	last for a long time/may cause pollution of water supplies eyesore	1 1
(c)		they may melt if they are thermoplastics	1 1
(d)		used to heat homes/factories	1
			TOTAL 8