

Name of the Student: _____

Max. Marks : 16 Marks

Time : 16 Minutes

Mark Schemes

Q1.

- (a) (i) C_nH_{2n} / C_xH_{2x} 1
- (ii) Fractional distillation / GLC / gas liquid chromatography / fractionation
*Do **not** allow cracking / distillation* 1
- (b) (i) But-1-ene / but1ene
Ignore hyphens and commas
*Do **not** allow butene-1 / but-2-ene / butane / butane /alkene / C_4H_8 / propene / straight-chain alkene* 1
- (ii) A structure of cyclobutane or methyl-cyclopropane
Allow skeletal formula. 1
- (c) (i) $C_{15}H_{32} \rightarrow 2C_4H_8 + C_7H_{16}$
Do not accept multiples. 1
- (ii) Thermal cracking
Not catalytic cracking or cracking. 1
- To produce products that are in greater demand / more valuable / more expensive / more profitable
The (unsaturated) alkene or the (unsaturated) molecule or X produced can be polymerised or can be made into plastics.
Ignore more useful products. 1
- (iii) Break (C–C or C–H) bonds
Allow to overcome the activation energy.
Allow to break the carbon chain.
Penalise breaking wrong bonds. 1
- (d) (i) H₂
Only. 1

(ii) Fuel / LPG

Allow camping gas, lighter fuel, propellant, refrigerant, cordless appliances.

Do not allow petrol or motor fuel.

Ignore natural gas.

1

(iii) $\text{C}_4\text{H}_{10} + 2.5\text{O}_2 \rightarrow 4\text{C} + 5\text{H}_2\text{O}$

Accept multiples.

1

(iv) SO_2 / sulfur dioxide

If other sulfur oxides, mark on.

1

Calcium oxide / CaO / lime / quicklime

Allow CaCO_3 / allow $\text{Ca}(\text{OH})_2$ or names.

Allow any solid base.

M2 dependent on M1.

Do not allow limewater.

1

(v) Neutralisation

Allow acid-base reaction.

Allow flue gas desulfurisation / FGD

1

(e) (Molecules) are similar sizes / have similar M_r / have similar number of electrons

Chemical error CE = 0/2 if breaking bonds.

Allow similar number of carbon and hydrogen atoms / similar surface area / similar chain length.

Can accept same number of carbon atoms.

Do not accept same number of H atoms / same number of bonds.

Ignore similar amount of bonds.

1

Similar van der Waals forces between molecules / similar intermolecular forces (IMF)

Not similar incorrect IMF eg dipole-dipole

1

[16]