

Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Mark Schemes

Q1.

- (a) M1 curly arrow from lone pair on oxygen of hydroxide ion to H atom on C-H adjacent to C-Br 1

M2 curly arrow from single bond of adjacent C-H to adjacent single bond C-C
(only credit M2 if M1 is being attempted to correct H atom) 1

M3 curly arrow from C-Br bond to side of Br atom
(credit M3 independently) 1

- (b) M1 credit a correct structure for either geometrical E-Z isomer and its designation as either cis or trans.
OR credit two correct geometrical E-Z isomer structures (ignore the names)
OR credit two correct names for cis pent-2-ene and trans pent-2-ene (ignore the structures) 1

M2 credit a second mark if all four parts of the required structures and names are correct.
(credit "linear" structures)
(insist on the alkyl groups being attached clearly by C-C bonds) 1

- (c) (i) M1 curly arrow from middle of C = C bond to H atom on H-Br
(penalise M1 if partial negative charge or formal positive charge on H)
(penalise M1 if pent-2-ene is used) 1

M2 curly arrow from H-Br bond to side of Br atom 1

M3 correct structure for correct secondary carbocation 1

M4 curly arrow from lone pair on bromide ion to the positive carbon of carbocation, ensuring that bromide ion has a negative charge.
(with the exception of pent-2-ene, if the wrong alkene is used, only penalise the structure M3)

(penalise the use of two dots in addition to a covalent bond, once only)

1

(ii) 1-bromopentane

1

(iii) M1 2-bromopentane is formed via the secondary (or 2°) carbocation

1

OR 1-bromopentane is formed via the primary (or 1°) carbocation

M2 a secondary carbocation is more stable than a primary carbocation -

award this mark only if the quality of language justifies the award.

(the argument must involve clear statements about carbocations)

1

[12]

Q2.

- | | | | |
|-----|------|---|---|
| (a) | M1 | fermentation | 1 |
| | M2 | dehydration or elimination | 1 |
| (b) | (i) | yeast OR zymase OR an enzyme | 1 |
| | (ii) | <u>concentrated</u> sulphuric or phosphoric acid
(penalise aqueous or dilute as a contradiction) | 1 |
| (c) | (i) | primary or 1° | 1 |
| | (ii) | sugar or glucose or ethanol is renewable
OR ethanol does not contain sulphur-containing impurities
OR ethanol produces <u>less</u> pollution or is <u>less</u> smoky or <u>less</u> CO/C
(the objective is a positive statement about ethanol)
(penalise the idea that ethanol is an infinite source or vague
statements that ethanol has less impurities) (penalise the idea that
ethanol produces no pollution) | 1 |
| (d) | | $C_2H_6 \rightarrow C_2H_4 + H_2$ | 1 |
| (e) | | Addition
(ignore self or chain as a preface to "addition")
(penalise additional) | 1 |

[8]