

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Mark Schemes

Q1.

- (a) **M1** The (relative) tendency of an atom to attract a pair of electrons/ the electrons/ electron density in a covalent bond

1

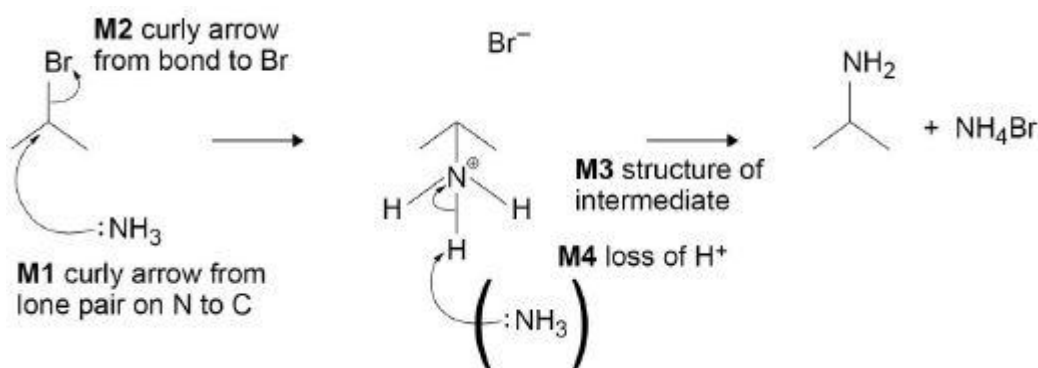
M2 Br is more electronegative than C (or vice versa)

1

M3 So Br is δ^- and C is δ^+

1

(b)



M4 Penalise loss of H^+ using Br^-
 Allow S_n1

4

(c) **M1**

Allow + outside square brackets

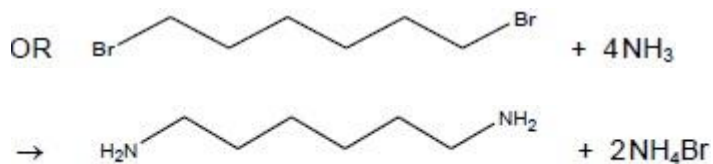
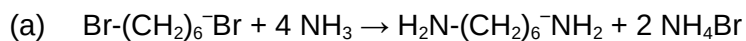
1

M2 Use: (Hair) conditioner / (Cationic) surfactant / disinfectant
 Allow fabric softener

1

[9]

Q2.



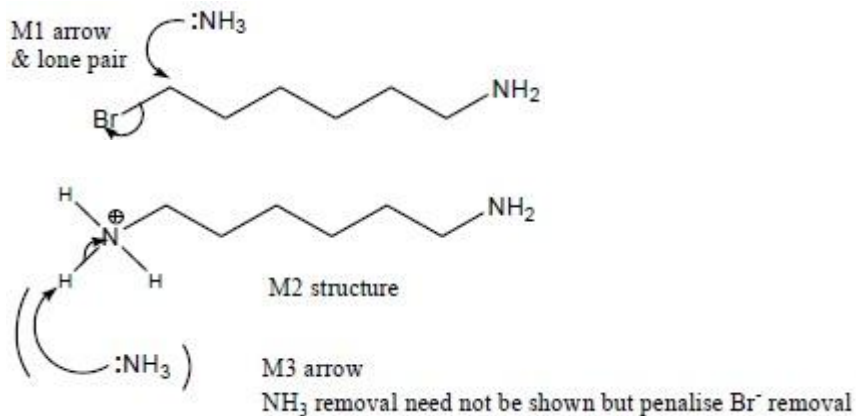
M1 both organic compounds correct (not molecular formulae)

Allow one correct structural formula and the other correct molecular formula of type $\text{XC}_6\text{H}_{12}\text{X}$

M2 balanced

2

(b)



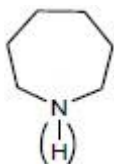
Or with structural formulae, $\text{Br}(\text{CH}_2)_6\text{NH}_2$ etc

Allow $\text{S}_{\text{N}}1$

Penalise incorrect partial charges in **M1**

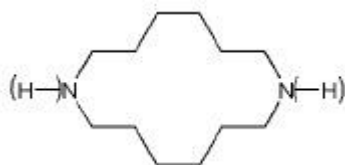
3

Impurity



(or as structural formula)

Allow



1

(c) **M1** Stage 1 reagent KCN or NaCN

Not HCN this loses **M1** and **M2**

Any mention of acid loses **M1** & **M2**

1

M2 Stage 1 condition aqueous alcohol

M2 dependent on correct **M1** (allow condition if only CN^- ions)

1

M3 Stage 2 reagent & condition H_2 and Ni or Pt or Pd

M3 only accessible if a cyanide is used in stage 1

1

Allow $LiAlH_4$ (in dry ether) – acidic/aqueous = CE, but allow followed by acid.

NOT $NaBH_4$ NOT Sn/HCl or Fe/HCl

Ignore heat and reflux and pressure

Apply list principle to incorrect reagents/conditions

(d) In 3-aminopentane

Allow converse for ammonia

Lone pair on N more available or Lone pair on N accepts H^+ better

Or greater stability of protonated N

1

because of alkyl electron pushing /inductive effect

Mark independently

1

(e) No carbon (atom is) attached to 4 different groups

Allow central carbon has two alkyl groups

Allow symmetrical molecule

1

[12]