Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Optical isomerism

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Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

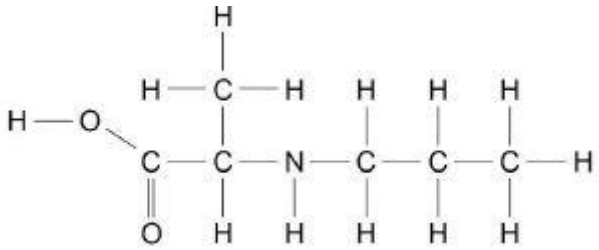
(a) One circled C atom only – The C attached to CH_3/C=O/ H and NH

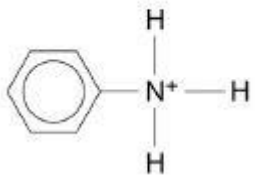
1

(b) Two ticks only for amine and amide

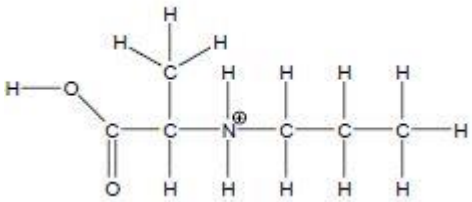
1

(c)





M1 *for choosing the correct bond to hydrolyse*
M2 *and* ***M3*** *for the correct structures of the products*
Allow protonated amino acid for M2



Allow $C_6H_5NH_3^+$ *or + outside a square bracket*

3

(d) **M1** Enzyme has an <u>active site</u>

1

M2
The G-Enantiomer / Enzyme has the correct stereo chemistry / stereospecific
Or
The G-Enantiomer / Enzyme has the complementary shape
For M2 allow opposite argument for F-Enantiomer

1

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Q2.

(a) $Br\text{-}(CH_2)_6\text{-}Br + 4\ NH_3 \rightarrow H_2N\text{-}(CH_2)_6\text{-}NH_2 + 2\ NH_4Br$

OR

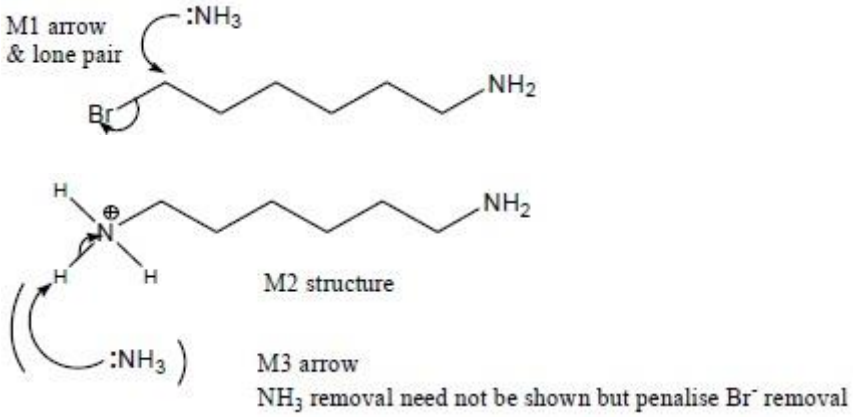
→

M1 *both organic compounds correct (not molecular formulae)*

Allow one correct structural formula and the other correct molecular formula of type $XC_6H_{12}X$

M2 *balanced*

2

(b) 

Or with structural formulae, $Br(CH_2)_6NH_2$ *etc*

Allow S_N1

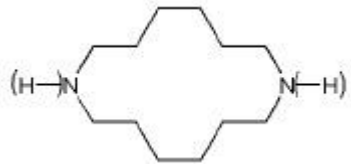
Penalise incorrect partial charges in ***M1***

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

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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

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