

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Mark Schemes

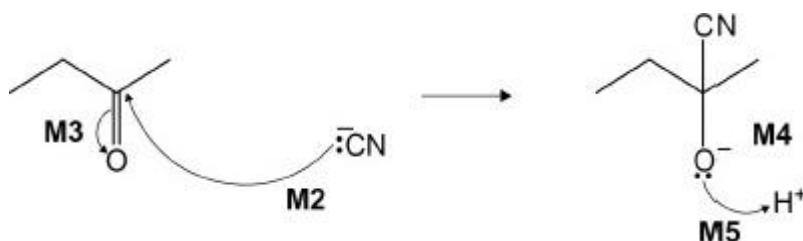
Q1.

(a) **M1** Electrophilic Addition**M2** HBr

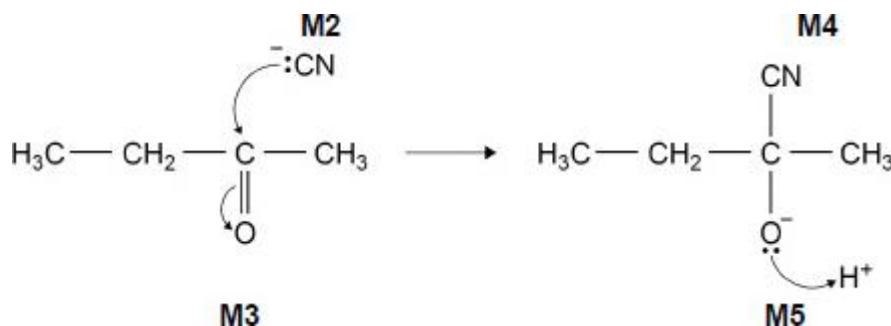
2

(b) **M1** Butan-2-ol or correct structure eg $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}_3$ **M2** NaOH AND (warm) aqueous (Allow cold if stated)

2

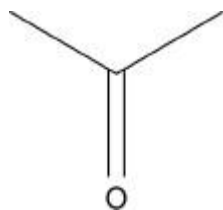
(c) **M1** HCN or KCN/ H_2SO_4 **M2** Arrow from lone pair on C to C of $\text{C}=\text{O}$ **M3** Arrow from $\text{C}=\text{O}$ to O**M4** Structure of intermediate including negative on O**M5** Arrow from lone pair on O to H^+

OR



5

(d)



planar/ flat

Allow planar carbonyl group

M2 Equal chance (50/50) attack from above/below OWTTE

Either side

M3 Giving equal amounts of both optical isomers/enantiomers

3

[12]

Q2.

(a) **M1** Tollens' reagent or ammoniacal silver nitrate

M2 silver mirror

M3 no reaction / no (visible) change / colourless

Alternative

M1 sodium

M2 no reaction / no (visible) change

M3 fizzing / bubbles / effervescence

OR

M1 Fehling's solution

M2 orange/brick/red solid/precipitate

M3 no reaction / no (visible) change

Do not allow acidified potassium dichromate(VI)

*If no reagent or incorrect reagent in **M1**, then no marks can score in **M2/3***

*Allow name or formula of suitable reagent for **M1**. Penalise incorrect formula of correct reagent in **M1** (even if correct name also given) but mark on for **M2/3***

*For Tollens': ignore AgNO_3 or $[\text{Ag}(\text{NH}_3)_2]^+$ or silver mirror test or "Tollings' reagent" on their own, but mark on for **M2/3**. Allow silver/black precipitate/solid/deposit for **M2**.*

*For Fehling's (or Benedict's): ignore $\text{Cu}^{2+}(\text{aq})$ or CuSO_4 or "Fellings" on their own, but mark on for **M2/3***

Ignore "nothing (happens)" / "no observation"

3

(b) **M1** bromine (water) / Br_2 / $\text{Br}_2(\text{aq})$

M2 orange/yellow / no reaction / no (visible) change

M3 colourless / decolourised

Alternative

M1 acidified potassium manganate(VII) / KMnO_4/H^+

M2 no reaction / no (visible) change / purple

M3 colourless / decolourised

*If no reagent or incorrect reagent in **M1**, then no marks can score in **M2/3***

*Allow name or formula of suitable reagent for **M1**. Penalise incorrect formula of correct reagent in **M1** (even if correct name also given) but mark on for **M2/3**.*

*Allow brown-red or brown for **M2**. (Ignore red)*

*Ignore clear for **M3***

3

(c) **M1** $\text{H} = 1.0078$

M2 $\text{C} = 12.0096$

M3 $M_r = (6 \times M1) + (6 \times M2) = 78.1044$

M2 Allow ECF from **M1**

M3 Allow ECF from **M1** and **M2**

Penalise not giving answers to 4dp once only (on the first occasion it would score otherwise)

(providing answers are given to at least 2dp)