

Name of the Student: _____

Max. Marks : 24 Marks

Time : 24 Minutes

Mark Schemes

Q1.

(a) **Must be a single test-tube reaction***If incorrect reagent then no marks***M1** Reagent: acidified potassium dichromate **OR** $\text{K}_2\text{Cr}_2\text{O}_7/\text{H}_2\text{SO}_4$ **OR** $\text{K}_2\text{Cr}_2\text{O}_7/\text{H}^+$ **OR** acidified $\text{K}_2\text{Cr}_2\text{O}_7$ *For acidified potassium dichromate: if "dichromate" or "(potassium) dichromate(IV)" or incorrect formula or no acid, penalise **M1** but mark on - ignore dichromate described as "yellow" or "red".*

1

M2-1-ol (orange to) green solution **OR** goes green

1

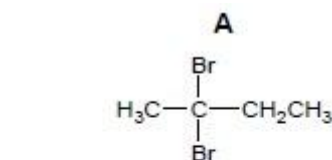
M3-2-ol no (visible/observed) reaction/change or NVR or stays orange

1

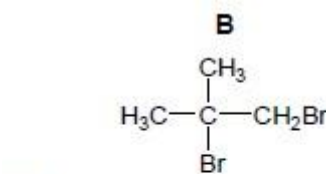
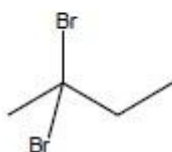
OR

M1 Reagent: acidified potassium manganate(VII) or $\text{KMnO}_4/\text{H}_2\text{SO}_4$ **OR** KMnO_4/H^+ **OR** acidified KMnO_4 **M2**-1-ol (purple to) colourless solution **OR** goes colourless**M3**-2-ol no (visible/observed) reaction/change or stays purple*For acidified potassium manganate(VII): If "manganate" or "(potassium manganate(IV))" or incorrect formula or no acid, penalise **M1** but mark on Credit alkaline / neutral KMnO_4 for possible full marks but **M2** gives brown precipitate or solution goes green*

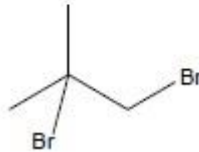
(b)



OR

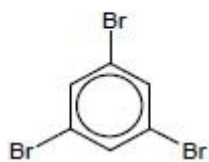
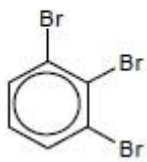


OR



2

(c)

C**D**

Allow Kekulé structures

Penalise missing aromatic ring each time

2

(d) **F**

G**E**

1

[8]

Q2.

(a) 4 peaks

1

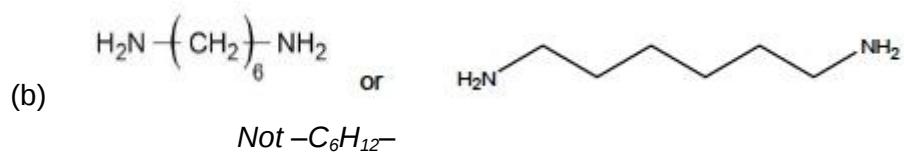
Triplet

1

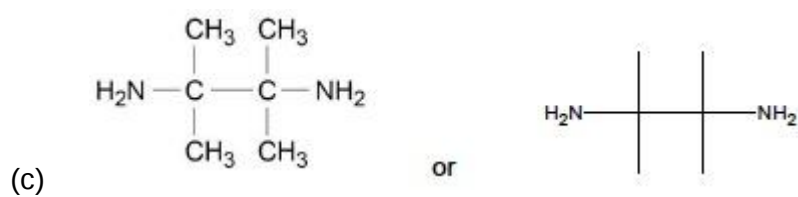
Two H on adjacent C

M3 dependent on correct M2

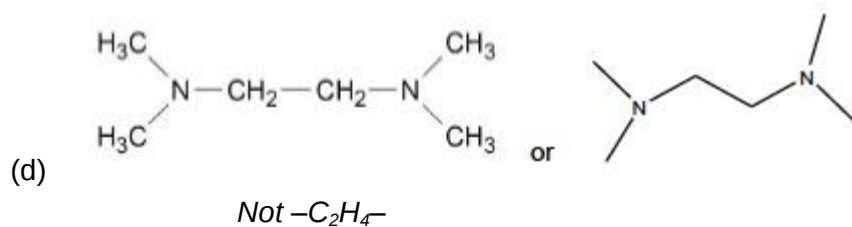
1



1



1



1

[6]

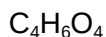
Q3.

(a) $(\text{COOH})_2 = \text{C}_2\text{H}_2\text{O}_4 = 90$

M1

$118 - 90 = 28$ OR C_2H_4

M2



M3

Must be molecular formula

Structural formula can score M1 & M2

(b) Amount NaOH = $(21.60 \times 10^{-3}) \times 0.109$

$= 2.3544 \times 10^{-3} \text{ mol}$

M1 for answer (to 3sfs min)

M1

Amount H_2A in $25 \text{ cm}^3 = 1.177 \times 10^{-3} \text{ mol}$

M2 = $0.5 \times \text{M1}$

M2

Amount H_2A in $250 \text{ cm}^3 = 1.177 \times 10^{-2} \text{ mol}$

M3 = **M2** $\times 10$

M3

Mass = 1.39 g (Must be 3sf)

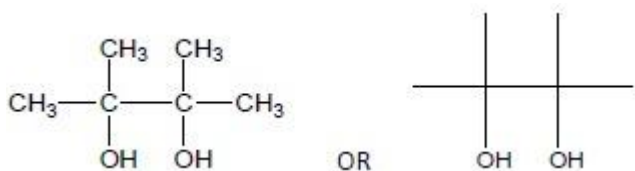
M4 = answer to (**M3** $\times 118$) and must be 3sf

M4

(c) 4 or four

1

(d)



1

(e) The precise (relative molecular) masses are different or wtte

Allow M_r are different to 2 or more or several dp

Ignore different molecular formula

Ignore accuracy

Penalise fragments

1

[10]