Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

(a) 2-chloropropanoic acid **(1)**

1

(b) δ 1.72 Doublet ∴ next to CH **(1)**

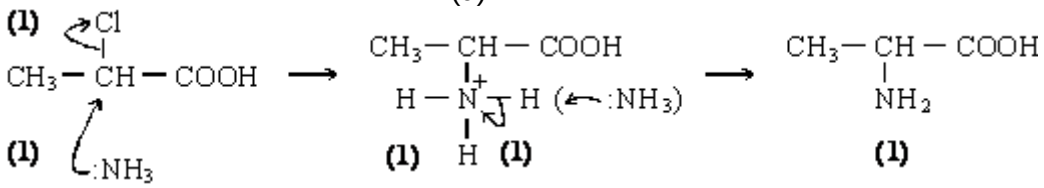
δ 4.44 Quartet ∴ next to CH_3 **(1)**

2

(c) Two triplets **(1)**

1

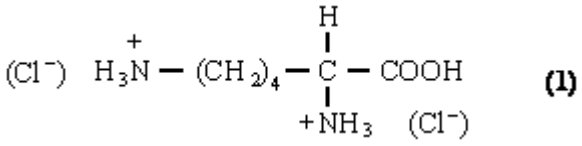
(d)



Allow S_N1

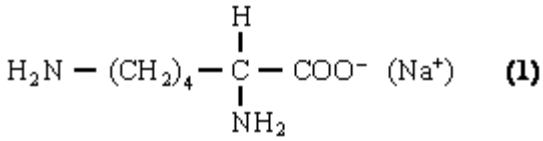
5

(e) (i)



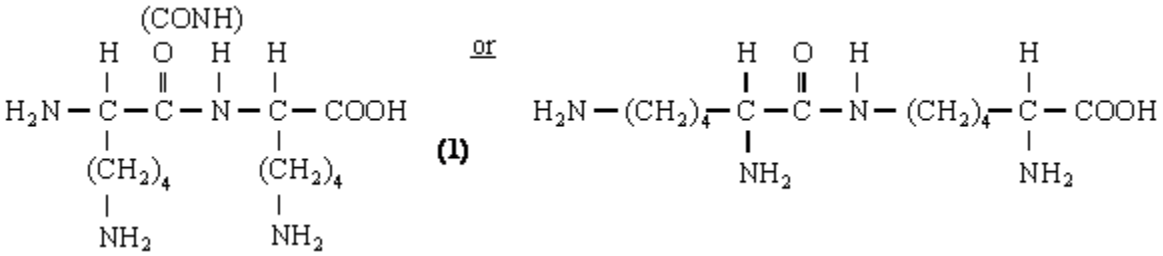
(1)

(ii)



(1)

(iii)



(1)

Or anhydride

3

[12]

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Q2.

(a) (i) 0.86 **(1)**

(ii) total moles = 0.86 + 0.43 +0.085 = 1.375 **(1)**

∴ **mole fraction of H_2** = $\frac{0.86}{1.375}$ = 0.625 **(1)**

(0.62 - 0.63)

Conseq on (i)

(iii) pp = mole fract^n × total P **(1)**

= $0.625 \times 1.75 \times 10^4$

= 1.09×10^4 (kPa) **(1)**

or 1.1(0)

Ignore units

Conseq on (ii)

5

(b) (i) $K_p = \frac{P_{CH3OH}}{P^2_{H_2} \times P_{CO}}$ **(1)**

Penalise [ ]

(ii) $K_p = \frac{2710}{(12300)^2 \times (7550)} = 2.37\ (2.4) \times 10^{-9}$ **(1)**

OR 2.37×10^{-15}

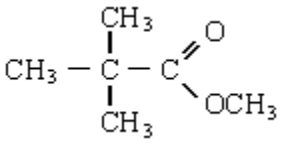
Units: kPa^{-2} **(1)**

or Pa^{-2}

not conseq to wrong K_p expression

3

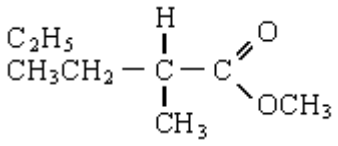
(c) *Isomer **E**:*



(1)

allow $(CH_3)_3CCOOCH_3$ or $(CH_3)_3CCO_2CH_3$

*Isomer **F**:*



(1)

2

[10]

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