

Name of the Student: _____

Max. Marks : 13 Marks

Time : 13 Minutes

Mark Schemes

Q1.

- (a) (i) Moles NaOH = $mv/1000 = 1.50 \times 72.5/1000 = 0.108$ to 0.11 **(1)**
 Moles of ethanoic acid at equilibrium = moles sodium hydroxide **(1)**
 Moles ester = moles water (=moles acid reacted) **(1)**
 $= 0.200 - 0.108 = 0.090$ to 0.092 **(1)**
 Moles ethanol = $0.110 - 0.091 = 0.018$ to 0.020 **(1)**
 $K_c = [\text{Ester}] [\text{Water}] / [\text{Acid}] [\text{Alcohol}]$ **(1)**

Allow if used correctly

$$= (0.091)^2 / 0.109 \times 0.019 = 3.7 \text{ to } 4.9 \text{ (1)}$$

*Ignore units**NB Allow the answer 4 one mark as correct knowledge*

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- (ii) Similar (types) of bond broken and made **(1)**
Same number of the bonds broken and made **(1)**

*any number if equal**NB If a list given then the total number of each type of bond broken and made must be the same*

2

- (b) (i) (Weak) dipole-dipole attraction between HCl molecules **(1)**
 (Strong) **hydrogen bonds** between CH_3COOH molecules **(1)**

NB Ignore van der Waals forces

2

- (ii) Ethanoic anhydride is

cheap compared to ethanoyl chloride **(1)**less corrosive than ethanoyl chloride or HCl evolved **(1)**reaction less violent or vigorous or exothermic or dangerous
or safer to use **(1)**less vulnerable to hydrolysis **(1)**reaction more easily controlled **(1)**

Max 2

[13]