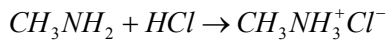
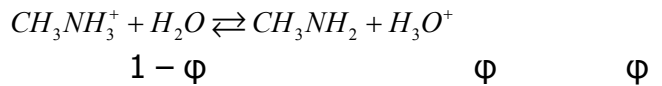
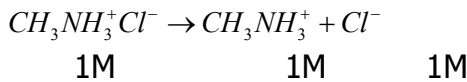


$$(1) \Rightarrow 1V_1 + 0,01V_2 = 0,1V_1 + 0,1V_2 \Rightarrow V_1 - 0,1V_1 = 0,1V_2 - 0,01V_2 \Rightarrow \frac{V_1}{V_2} = \frac{1}{10}$$

3.3 $n_{CH_3NH_2} = 0,1 \cdot 1 = 0,1 \text{ mol}$ αν $n_{HCl} = 0,1 \text{ mol}$



Αρχ.	0,1	0,1	-	$C_{CH_3NH_3^+Cl^-} = \frac{0,1}{0,1} = 1M$
Αντ/παρ.	-0,1	-0,1	0,1	
Τελ.	0	0	0,1	



$$K_a = 10^{-10} = \frac{\phi^2}{1-\phi} \Rightarrow 10^{-10} = \frac{\phi^2}{1} \Rightarrow \phi = 10^{-5} M \text{ και } pH = 5$$

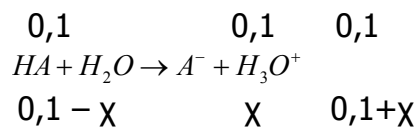
- αν $n_{HCl} > 0,1 \text{ mol}$ τότε στο τελικό διάλυμα θα είχαμε $HCl - CH_3NH_3^+Cl^-$ το pH < 5 απορρ.
- αν $n_{HCl} < 0,1 \text{ mol}$ τότε στο τελικό διάλυμα θα είχαμε $CH_3NH_2 - CH_3NH_3^+Cl^-$ το pH > 5 απορρ.

Θέμα 4°

α . $pH = 3 \Rightarrow [H_3O^+] = 10^{-3} \Rightarrow a \cdot C = 10^{-3} \Rightarrow C = \frac{10^{-3}}{10^{-2}} \Rightarrow C = 0,1M$

$$K_{a(HA)} = a^2 \cdot C = 10^{-4} \cdot 0,1 \Rightarrow K_{a(HA)} = 10^{-5}$$

β. $C = \frac{0,1}{1} \Rightarrow C = 0,1M$ $HCl + H_2O \rightarrow Cl^- + H_3O^+$

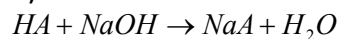
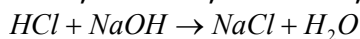


$$K_a = 10^{-5} = \frac{x(0,1+x)}{0,1-x} \Rightarrow 10^{-5} = \frac{0,1x}{0,1} \Rightarrow x = 10^{-5}$$

(i) $a = \frac{x}{C} = \frac{10^{-5}}{0,1} = 10^{-4}$

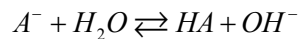
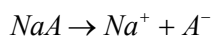
(ii) $[H_3O^+] = 0,1 + 10^{-5} \approx 0,1 \Rightarrow pH = 1$

γ. HA : 0,1 mol , HCl : 0,1 mol , NaOH : 0,2 mol

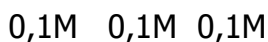


Αρχ.	0,1	0,2	-	
Αντ/παρ.	-0,1	-0,1	0,1	
Τελ	0	0,1	0,1	

$$C_{NaA} = C_{NaCl} = 0,1M$$



$$K_{b(A^-)} = 10^{-9} = \frac{\psi^2}{0,1-\psi} \Rightarrow \psi = 10^{-5}$$



pOH = 5 και pH = 9