b) $\overset{B}{NH_3} + \overset{A}{H_2O_{(l)}} \rightleftharpoons OH^-_{(aq)} + NH_4^+_{(aq)}$

I	0.350m	–	~0m	0m
C	-x		+x	+x
E	0.350 - x		x	x

$K = \frac{[Products]}{[Reactants]} = \frac{x^2}{[0.350 - x]}$

$K_B = \frac{K_W}{K_A} = \frac{1.0 \times 10^{-14}}{5.8 \times 10^{-10}}$

$= 1.7_2 \times 10^{-5}$

$1.7_2 \times 10^{-5} = \frac{x^2}{0.350}$

$(1.7_2 \times 10^{-5})(0.350) = x^2$

$\sqrt{6.0_2 \times 10^{-6}} = x$

$x = 0.0024_5$

Rule of 500

$\frac{0.350}{1.7_2 \times 10^{-5}} = > 500$

$[OH^-] = 0.0024_5$

$\rightarrow 0.0025$

$pOH = -\log(OH)$

$= -\log(0.0024_5)$

$= 2.61$

$pH = 14 - 2.61$

$= 11.39$

$[H_3O] = 10^{-pH}$

$= 10^{-11.39} = 4.0_7 \times 10^{-12}$

$\rightarrow 4.1 \times 10^{-12}$

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