Date Planned : __ / __ / __	Daily Tutorial Sheet-12	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-3	Exact Duration :_____

141. Study the following table.

Buffer Solution	I	II	III	IV
Volume (in mL) of 1 M weak acid	4.0	4.0	40.0	0.1
Volume (in mL) of 0.1 M sodium salt of weak acid	4.0	40.0	4.0	10.0

Which of the two sets of buffer solution have least pH ?

(A) I and II **(B)** I and III **(C)** II and III **(D)** II and IV

142. If the equilibrium constant of the reaction of weak acid HA with strong base NaOH is 10^9, then pH of 0.1 M NaA is :

(A) 5 **(B)** 9 **(C)** 7 **(D)** 8

143. In aqueous solution, the ionization constant for carbonic acid are :

$K_1 = 4.2 \times 10^{-7}$ and $K_2 = 4.8 \times 10^{-11}$

Select the correct statement for a saturated 0.034 M solution of the carbonic acid :

(A) The concentrations of H^+ and HCO_3^- are approximately equal

(B) The concentration of H^+ is double than that of CO_3^{2-}

(C) Concentration of CO_3^{2-} is 0.034 M

(D) The concentration of CO_3^{2-} is greater than that of HCO_3^-

144. Auto-ionisation of liquid NH_3 is:

$2NH_3 \rightleftharpoons NH_4^+ + NH_2^-$

with $K_{NH_3} = [NH_4^+][NH_2^-] = 10^{-30}$ at -50^oC

Number of amide ions (NH_2^-), present per mm^3 of pure liquid NH_3 is:

(A) 602 **(B)** 301 **(C)** 200 **(D)** 100

145. A mixture of weak acid is 0.1 M in HCOOH $(K_a = 1.8 \times 10^{-4})$ and 0.1 M in HOCN $(K_a = 3.1 \times 10^{-4})$. Hence, $[H_3O^+]$ is approximately:

(A) $10^{-2}M$ **(B)** $4.1 \times 10^{-4}M$ **(C)** $5 \times 10^{-4}M$ **(D)** $4.1 \times 10^{-3}M$

***146.** In H_3PO_4, which of the following is true ?

(A) $K_a = K_{a_1} \times K_{a_2} \times K_{a_3}$ **(B)** $K_{a_1} < K_{a_2} < K_{a_3}$

(C) $K_{a_1} > K_{a_2} > K_{a_3}$ **(D)** $K_{a_1} = K_{a_2} = K_{a_3}$