

**Topic : Chemical Equilibrium**
**Type of Questions**

Single choice Objective ('-1' negative marking) Q.1 to Q.8

(3 marks, 3 min.)

M.M., Min.

[24, 24]

- For the homogeneous gaseous reaction :  $4\text{NH}_3 + 5\text{O}_2 \rightleftharpoons 4\text{NO} + 6\text{H}_2\text{O}$ , the equilibrium constant  $K_c$  has the units of :  
 (A)  $(\text{Conc.})^{-10}$       (B)  $(\text{Conc.})^1$       (C)  $(\text{Conc.})^{-1}$       (D) It is dimensionless.
- Select the gaseous reaction for which the equilibrium constant is written as :  $[\text{MX}_3]^2 = K[\text{MX}_2]^2 [\text{X}_2]$   
 (A)  $\text{MX}_3 \rightleftharpoons \text{MX}_2 + \frac{1}{2} \text{X}_2$       (B)  $2\text{MX}_3 \rightleftharpoons 2\text{MX}_2 + \text{X}_2$   
 (C)  $2\text{MX}_2 + \text{X}_2 \rightleftharpoons 2\text{MX}_3$       (D)  $\text{MX}_2 + \frac{1}{2} \text{X}_2 \rightleftharpoons \text{MX}_3$
- In order to increase the rate of forward reaction :  $2\text{A}(\text{g}) + 3\text{B}(\text{g}) \rightleftharpoons \text{Product}$ , 32 times, it is necessary to :  
 (A) Make the conc. of A and B three times      (B) Make the conc. of A and B two times  
 (C) Make the conc. of A and B half      (D) Make the conc. of A and B four times
- For the reaction,  $\text{A} + 2\text{B} \rightleftharpoons 2\text{C}$ , the rate constants for the forward and the backward reactions are  $1 \times 10^{-4}$  and  $2.5 \times 10^{-2}$  respectively. The value of equilibrium constant, K for the reaction would be :  
 (A)  $1 \times 10^{-4}$       (B)  $2.5 \times 10^{-2}$       (C)  $4 \times 10^{-3}$       (D)  $2.5 \times 10^2$
- An equilibrium system for the reaction between hydrogen and iodine to give hydrogen iodide at 765 K in a 5 litre volume contains 0.4 mole of hydrogen, 0.4 mole of iodine and 2.4 moles of hydrogen iodide. The equilibrium constant for the reaction is :  $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$   
 (A) 36      (B) 15      (C) 0.067      (D) 0.28.
- For a gaseous reaction,  $2\text{A} + \text{B} \rightleftharpoons 2\text{C}$ , the partial pressures of A, B and C at equilibrium are 0.3 atm, 0.4 atm and 0.6 atm respectively. The value of  $K_p$  for the reaction would be :  
 (A)  $10 \text{ atm}^{-1}$       (B)  $1/10 \text{ atm}^{-1}$       (C)  $0.2 \text{ atm}^{-1}$       (D)  $5 \text{ atm}^{-1}$
- The active mass of 64 g of HI in a two litre flask would be :  
 (A) 2      (B) 1      (C) 5      (D) 0.25
- For the reaction ,  $\text{A} + \text{B} \rightleftharpoons 3 \text{C}$  , if 'a' moles/litre of each 'A' & 'B' are taken initially , then the incorrect relation about concentrations at equilibrium is :  
 (A)  $[\text{A}] - [\text{B}] = 0$       (B)  $3 [\text{B}] + [\text{C}] = 3a$       (C)  $3 [\text{A}] + [\text{C}] = 3a$       (D)  $[\text{A}] + [\text{B}] = 3 [\text{C}]$



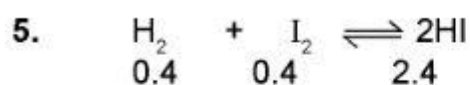
# Answer Key

DPP No. # 37

1. (B)      2. (C)      3. (B)      4. (C)      5. (A)  
6. (A)      7. (D)      8. (D)

## Hints & Solutions

DPP No. # 37



$$K = \frac{2.4 \times 2.4}{0.4 \times 0.4} = 36 \quad (\text{Since volume term is cancelled})$$

7. Mol. mass of HI = 1 + 127 = 128  
64 g HI = 64 / 128 = 0.5 mole

$$[\text{HI}] = \frac{0.5}{2} \text{ M} = 0.25 \text{ M}$$

