

CHEMISTRY-11	Chapter#08 First Half (8.1-8.2) Test-4		
	Name:	Class:	ID:
Date: / /	Marks Total: 30	Marks Obtained:	
Time Allowed: 50 Min.			

Maximum Marks: 10

(OBJECTIVE TYPE)

Time Allowed: 10 Min.

NOTE: Tick The Correct Option:

1. Which statement about the following equilibrium is correct?



- (a) The value of K_p falls with rise in temperature.
 (b) The value of K_p falls with increasing pressure.
 (c) Adding V_2O_5 catalyst increases the equilibrium yield of SO_3 .
 (d) The value of K_p is equal to K_c .

2. The unit of K_c for the reaction $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g})$:

- (a) Moles/dm⁻³ (b) Moles⁻¹/dm⁻³ (c) Moles⁻²/dm⁺⁶ (d) No unit

3. The relationship between K_p and K_c is given by:

- (a) $K_c = K_p$ (b) $K_c = K \left(\frac{P}{N} \right)^{\Delta n}$ (c) $K_p = K_c (RT)^{\Delta n}$ (d) $K_p = K_c (RT)^{-\Delta n}$

4. The optimum pressure for Haber's process is:

- (a) 100-150 atm (b) 200-300 atm (c) 350-450 atm (d) 500-600 atm

5. The term active mass, for dilute solutions, means:

- (a) Moles dm⁻³ (b) Grams dm⁻³ (c) Moles m⁻³ (d) Grams m⁻³

6. A chemical system at equal equilibrium can be made to move in forward direction by:

- (a) Decreasing the conc. of reactants (b) Decreasing the conc. of products
 (c) Increasing the conc. of the products (d) All of the above

7. Increase in temperature favours _____ reaction.

- (a) Endothermic (b) Exothermic (c) Both 'a' & 'b' (d) None

8. When we increase pressure on ice, it will melt because:

- (a) Pressure provides energy to the molecules.
 (b) The freezing point of ice is further lowered.
 (c) Ice has greater volume than freezing water.
 (d) All

9. 80% of the total ammonia produced by Haber's process is used in:

- (a) Explosive production (b) Synthesizing polymers
 (c) The manufacture of fertilizers (d) The manufacture of medicine

10. The optimum conditions for the formation of SO_3 from SO_2 and O_2 in contact process are:

- (a) $P = 1 \text{ atm}$ $T = 650 \text{ K}$ (b) $P = 1 \text{ atm}$ $T = 650^\circ\text{C}$
 (c) $P = 200 \text{ atm}$ $T = 300^\circ\text{C}$ (d) $P = 300 \text{ atm}$ $T = 100^\circ\text{C}$

Maximum Marks: 20

(SUBJECTIVE TYPE)

Time Allowed: 40 Min.

SECTION-I

Q.2: Give brief answers to the following questions:

(12)

- i. Why does the rate of forward reactions slow down when a reversible reaction approaches the equilibrium stage?
- ii. Differentiate between K_c and K_p ? OR What is the relation between K_c and K_p ?
- iii. For some systems, K_c has no units. Explain.
- iv. Change in volume or pressure, changes the equilibrium position but not the equilibrium constant. Why?
- v. The change in temperature disturbs both the equilibrium position and the equilibrium constant. Justify it.
- vi. Being exothermic, ammonia should be synthesized at low temperature but temperature of 400°C is selected in Haber's process. Justify.

SECTION-II

NOTE: Attempt All Questions:

(08)

- Q.3: Esterification reaction between ethanol and acetic acid was carried out by mixing definite amounts of ethanol and acetic acid along with some mineral acid as a catalyst. Samples were drawn out of the reaction mixture to check the progress of the etherification found to be $[\text{CH}_3\text{COOH}] = 0.025 \text{ mol dm}^{-3}$, $[\text{C}_2\text{H}_5\text{OH}] = 0.032 \text{ mol dm}^{-3}$, $[\text{CH}_3\text{COOC}_2\text{H}_5] = 0.05 \text{ mol dm}^{-3}$, and $[\text{H}_2\text{O}] = 0.04 \text{ mol dm}^{-3}$. Find out the direction of the reaction if K_c for the reaction at 25°C is 4.
- Q.4: The equilibrium constant for the reaction between acetic acid and ethyl alcohol is 4.0. A mixture of 3 moles of acetic acid and one mole of $\text{C}_2\text{H}_5\text{OH}$ is allowed to come in moles and grams. Also calculate the masses of reactants left behind?