CHEMISTRY WORKSHEET CLASS-XI (2019) CHAPTER-(EQUILIBRIUM)

- 1. What do you understand by the term state of equilibrium?
- 2. Why equilibrium is said to be dynamic?
- 3. Which properties do remain constant in the following equilibrium?
- (a) solid---- \rightarrow liquid (b) liquid----→ gas ←----
- 4. Define vapour pressure.
- 5. A gas is in equilibrium with water at a certain temperature and pressure.. What will happen if (i) temperature is increased (ii) pressure is increased
- 6. Give two examples each of reversible and irreversible reactions.
- 7. Can catalyst affect the state of equilibrium?
- 8. What is the relationship between Kp and Kc?
- 9. Sort out the homogeneous and heterogeneous equilibrium from the following:-
- (i) $CaCO_3$ (s) ---- \rightarrow CaO (s) + CO₂ (g) ←-----

(ii)
$$CH_3COOH(I) + C_2H_5OH(I) \xrightarrow{------} CH_3COOC_2H5(I) + H_2O(I)$$

- 10. Write the equilibrium constant expression for the following:-
- (i) $2SO_2(g) + O_2(g) \xrightarrow{} 2SO_3(g)$

(ii)
$$BaSO_4$$
 (s) $\xrightarrow{} Ba^{2+}$ (aq) + SO_4^{2--} (aq)

- (iii) HCl (aq) + H₂O (l) ----- \rightarrow H₃O⁺ (aq) + Cl⁻(aq)
- 11. If the value K for the reaction $H_2(g) + I_2(g) \xrightarrow{----} 2HI(g)$ is 48, what would be the value

of K for the reaction $\frac{1}{2}H_2(g) + \frac{1}{2}I_2(g) - \cdots \rightarrow HI(g)$

- 12. The value of equilibrium constants for the reaction: Cu^{2+} (aq) + Zn (s) ----- \rightarrow Cu (s) + Zn²⁺ (aq) is 5.0 x 10⁸. In which direction is the reaction expected to great extent?
- 13. What will be the effect of increasing temperature on an exothermic reaction?
- 14. In Bronsted and Lowry concept, water is regarded as an amphoteric substance. Give examples to justify this statement.
- 15. Why water is regarded as Lewis base?
- 16. State and explain Henry's Law.
- 17. On the basis of Le chatelier's principle, discuss the conditions for obtaining the maximum yield of SO₃ In the following reaction:-

 $2SO_2(g) + O_2(g) ----- \rightarrow 2SO_3(g)$ H = --42 Kcal. 18. Write the balanced equation of the reaction whose equilibrium constant can be expressed as :

 $Kc = [NH_3]^4 [O_2]^5$

[NO] ⁴ [H₂O]⁶

- 19. Sort out the conjugate pairs in the following reactions:-
- (i) $H_2O(I) + CO_3^{2--}(aq) -------- HCO_3^{---}(aq) + OH^{---}(aq)$

(ii) $NH_4^+(aq) + S^{2--}(aq) \xrightarrow{} HS^{--}(aq) + NH_3(aq)$ \leftarrow

20. For the reaction at 127[°]C,

N₂ (g) + 3H₂ (g) ------ \rightarrow 2NH₃ (g) the partial pressures of N₂ and H₂ are 0.80 and 0.40 atm \leftarrow ------

respectively at equilibrium . The total pressure of the system is 2.80atm. Calculate Kp and Kc for the reaction. (Ans; 50 , 53.8 x 10 3)

be 9.15 bar . Calculate Kc , Kp and partial pressure at equilibrium. (Ans, Kc = 2.6 , Kp = 85.87)

- 22. 1.5 moles of $PCI_5(g)$ are heated in constant temperature in a closed vessel of 4L capacity. At the equilibrium PCI_5 is found to be 35% dissociated into PCI_3 and CI_2 . Calculate the equilibrium constant (Ans , Kc = 0.071)
- 23. The pH of a solution of lemon juice is 2.32 at 298 K . Calculate the [H_3O^+] and [OH⁻] Ans= 4.8 x 10⁻³, 2.08x 10⁻¹²
- 24.Calculate the $[H_3O^+]$ and $[OH^-]$ concentration in 1) 0.01M HCl 2) 0.005M NaOH solution at 298 K Ans 1) $[H_3O^+] = 1x10^{-2}$ M ,Ans 2 $[H_3O^+] = 2x10^{-2}$ M
- 25. Calculate the pH of a solution containing 2.0 g of NaOH per litre of the solution. (Ans= 12.7)
- 26. How many grams of NaOH must be dissolved in 1L of a solution to give its pH value of10.6 at 25°C?

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