12TH Chemistry

2 Marks Test

Q1. State Henry's law and mention some important applications? **2 Marks**

Q2. Draw all the isomers (geometrical and optical) of: **2 Marks**
$[Co(NH_3)Cl(en)_2]^{2+}$

Q3. How is the variability in oxidation states of transition metals different from that of the non transition metals? Illustrate with examples. **2 Marks**

Q4. Give the oxidation state, d orbital occupation and coordination number of the central metal ion in the following complex: **2 Marks**
$(NH_4)_2[CoF_4]$

Q5. Why do gases always tend to be less soluble in liquids as the temperature is raised? **2 Marks**

Q6. At 300 K, 36 g of glucose present in a litre of its solution has an osmotic pressure of 4.98 bar. If the osmotic pressure of the solution is 1.52 bars at the same temperature, what would be its concentration? **2 Marks**

Q7. From the rate expression for the following reactions, determine their order of reaction and the dimensions of the rate constant. **2 Marks**
$CH_3CHO\ (g) \rightarrow CH_4\ (g) + CO(g)$ Rate = $k\ [CH_3CHO]^{3/2}$

Q8. The resistance of a conductivity cell containing 0.001M KCl solution at 298 K is 1500 Ω. What is the cell constant if conductivity of 0.001M KCl solution at 298 K is 0.146×10^{-3} S cm^{-1}. **2 Marks**

Q9. Discuss the nature of bonding in the following coordination entitie on the basis of valence bond theory: **2 Marks**
$[Fe(CN)_6]^{4-}$

Q10. The decomposition of NH_3 on platinum surface is zero order reaction. What are the rates of production of N_2 and H_2 if $k = 2.5 \times 10^{-4}$ mol^{-1} L s^{-1}? **2 Marks**

Q11. How would you account for the irregular variation of ionisation enthalpies (first and second) in the first series of the transition elements? **2 Marks**

Q12. A reaction is second order with respect to a reactant. How is the rate of reaction affected if the concentration of the reactant is, **2 Marks**
1. Doubled
2. Reduced to half?

Q13. How would you account for the following: **2 Marks**
The d^1 configuration is very unstable in ions.

Q14. Indicate the types of isomerism exhibited by the following complexe and draw the structure for these isomer: **2 Marks**
$[Pt(NH_3)(H_2O)Cl_2]$

Q15. In what way is the electronic configuration of the transition elements different from that of the non transition elements? **2 Marks**

Q16. Henry's law constant for the molality of methane in benzene at 298 K is 4.27×10^5 mm Hg. Calculate the solubility of methane in benzene at 298 K under 760 mm Hg. **2 Marks**

Q17. Vapour pressure of pure water at 298 K is 23.8 mm Hg. 50 g of urea (NH_2CONH_2) is dissolved in 850 g of water. Calculate the vapour pressure of water for this solution and its relative lowering. **2 Marks**

Q18. Using the standard electrode potentials given in Table 3.1, predict if the reaction between the following is feasible:
Ag(s) and Fe^{3+} (aq) **2 Marks**

Q19. From the rate expression for the following reactions, determine their order of reaction and the dimensions of the rate constant.
$3NO(g) \rightarrow N_2O$ (g) Rate = $k[NO]^2$ **2 Marks**

Q20. The vapour pressure of water is 12.3 kPa at 300 K. Calculate vapour pressure of 1 molal solution of a non-volatile solute in it. **2 Marks**