

18. A buffer solution has maximum buffer capacity, when its pH is equal to _____.
19. In Inorganic qualitative analysis, II group sulphides are _____ soluble than IV group sulphides.
20. The molar solubility of CdCO_3 ($K_{sp} = 2.5 \times 10^{-13}$) is _____.

III. State whether true or false:**(5x1=5)**

21. “n” tetrahedral and “2n” octahedral voids are present in a close packed arrangement with “n” atoms.
22. Li_2O has anti fluorite structure.
23. NH_3 is more polar than NF_3 .
24. Only in pure water, $[\text{H}_3\text{O}^+] = [\text{OH}^-] = 10^{-7} \text{ M}$ at 298 K.
25. Precipitation of a sparingly soluble compound from its aqueous solution occurs when the ionic product exceeds its solubility product.

IV. Answer the following in a line or two:**(5x1=5)**

26. What are interfacial angles? Give an example.
27. What are non-stoichiometric defects?
28. Define magnetic susceptibility.
29. What is buffer action?
30. Mention the factors affecting the solubility of sparingly soluble salts.

SECTION – B**Answer any five questions:****(5x6=30)**

31. Derive Bragg's equation.
32. Discuss the structure of ZnS with the unit cell diagram.
33. Explain the principle involved in the measurement of dipole moments of molecules.
34. Derive Henderson-Hasselbach equation.
35. Write a brief account on common ion effect.
36. a) Explain the law of rational indices.
b) What are the elements of symmetry in a cubic crystal? **(3+3)**
37. What is radius ratio rule? Explain its significance.

SECTION – C**Answer any two questions:****(2x20=40)**

38. a) Explain the principle and the experimental technique involved in the determination of the structure of a crystalline solid by powder diffraction method. **(6)**
b) Discuss the structure and types of liquid crystals. Mention its applications. **(8)**
c) Explain i) Schottky defects ii) Frenkel defects **(6)**
39. a) Discuss i) paramagnetic ii) diamagnetic iii) ferromagnetic and iv) ferrimagnetic materials. **(10)**
b) Write briefly on salt hydrolysis and derive the expression for hydrolysis constant of a salt formed from a weak acid and a weak base. **(10)**
40. a) Discuss the applications of solubility product principle in the inorganic qualitative analysis. **(6)**
b) Explain the X-ray diffraction patterns of fcc and bcc types of cubic systems. **(8)**
c) Describe fluorite and anti-fluorite structure. **(6)**
