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TEST SERIES - XII

PHYSICAL CHEMISTRY (SOLIDS, SOLUTIONS, ELECTROCHEMISTRY, CHEMICAL KINETICS)

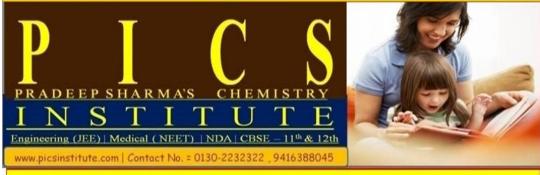
2 - Marks Each

- 1. Conductivity of 0.00241 M acetic acid is 7.896×10^{-5} S cm⁻¹. Calculate its molar conductivity and if Λ° for acetic acid is 390.5 S cm² mol⁻¹, what is its dissociation constant?
- 2. Analysis shows that nickel oxide has formula $Ni_{0.98}O_{1.00}$. What fractions of the nickel exist as Ni^{2+} and Ni^{3+} ions?
- 3. Give Antifluorite structure with example.
- 4. An element has d of 19.35 gm/c.c. and length of side of unit cell is 316 pm. The unit cell is b.c.c. How many atoms of element does 50 gm of element contain?
- 5. Define (a) Antiferroelectricity (b) Piezoelectricity
- 6. The half life period of a first order reaction is 600 s. What percent of A remain after 30 min.?
- 7. Derive relation b/n t99.9% and t99%.
- 8 . Classify the following solutions:
 - (a) acetone + CH_2Cl_2 (b) ethyle alcohol + H_2O
- 9. Why oxygen mixed with helium is used by deep sea divers? What is bends?
- 10. How does cathodic protection of iron operate?
- 11. HCl does not give an acidic solution in Benzene and why?
- 12. Give reactions & advantage of H2-O2 fuel cell over ordinary cells.
- 13. Write the chemistry of recharging the lead storage battery, highlighting all the materials that are involved during recharging.
- 14.A solution of $CuSO_4$ is electrolysed for 10 minutes with a current of 1.5 amperes .What is the mass of copper deposited at the cathode?
- 15. Show that in a first order reaction ,time required for completion of 99.9% is 10 times of half life of the reaction.
- 16. Give differences between order of reaction and molecularity? Which of them is affected by temperature?

3-Marks each

- 17. The half life of reaction is 50 mins. What will be the order of the reaction if reaction goes to completion in
- 18. The activation energy of a 1st order reaction at 300 K is 60 KJ/mol. In the presence of catalyst the activation energy lowered to 50 KJ/mol at 300K. How many times the reaction gets change in the presence of catalyst at same temperature?
- 19. 2 g of C_6H_5 COOH dissolved in 25g of benzene shows a depression in freezing point equal to 1.62 K, kf 5.15 Kkg mol⁻¹. What is the percentage association of acid if it forms double molecules (dimer) in solution?
- 20. Two elements A & B form compounds having molecular formula AB_2 & AB_4 . When dissolved in 20g of C_6H_6 , 1g AB_2 lowers the freezing point by 2.3 & 1g AB_4 lowers it by 1.3 K. The molar depression constant for benzene is 5.1 Kg mol⁻¹. Calculate atomic mass A & B.
- 21. Calculate e.m.f. for following cell Cd |Cd $^{+2}$ (0. 1M) || Ag $^{+1}$ (0.1M) | Ag E^{0} Cd $^{+2}$ / Cd = -0.40V ; E^{0} Ag $^{+}$ / Ag = 0.8V
- 22. The activation energy for the reaction
- $2HI_{(g)} \rightarrow H_2 + I_{2(g)}$ is 209.5 kJ mol⁻¹ at 581K. Calculate the fraction of molecules of reactants having energy equal to or greater than activation energy?

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