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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 $\Lambda°$ for acetic acid is 390 .5 S cm^2 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 $t_{99.9\%}$ and $t_{99\%}$.

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 H_2-O_2 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 100 mins?

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 1.3K.The molar depression constant for benzene is 5.1Kg 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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