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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  $7.896 \times 10^{-5}$  S cm<sup>-1</sup>. Calculate its molar conductivity and if  $\Lambda^{\circ}$  for acetic acid is 390.5 S cm<sup>2</sup> mol<sup>-1</sup>, 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 + CH2Cl2 (b) ethyle alcohol + H2O
- 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<sub>4</sub> 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?

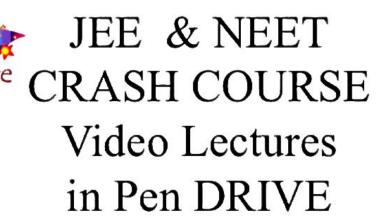
### 3-Marks each

- 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 1<sup>st</sup> 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<sup>-1</sup>. 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<sub>2</sub> & AB<sub>4</sub>. When dissolved in 20g of  $C_6H_6$ , 1g AB<sub>2</sub> lowers the freezing point by 2.3 & 1g AB<sub>4</sub> lowers it by 1.3K. The molar depression constant for benzene is 5.1Kg mol<sup>-1</sup>. Calculate atomic mass A & B.
- 21. Calculate e.m.f. for following cell Cd | Cd<sup>+2</sup> (0.1M) | Ag<sup>+1</sup> (0.1M) | Ag  $E^0$  Cd<sup>+2</sup> / Cd = -0.40V;  $E^0$  Ag<sup>+</sup> / Ag = 0.8V
- 22. The activation energy for the reaction
- $2HI_{(g)} \rightarrow H_2 + I_{2(g)}$  is 209.5 kJ mol<sup>-1</sup> at 581K. Calculate the fraction of molecules of reactants having energy equal to or greater than activation energy?

### Courier or Post the ANSWER SHEET to the following address

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