

**BAL BHARATI PUBLIC SCHOOL, GRHM, NEW DELHI**  
**CLASS – XII (SUMMER VACATION ASSIGNMENT – 2023)**

**SOLUTION- UNIT -1**

1. What type of a azeotrope is formed on mixing nitric acid with water? (1)
2. What type of solution an alloy belongs to? (1)
3. Define ebullioscopic constant or molal elevation constant. [Foreign 2012] (1)
4. What is Reverse osmosis? [AI 2011:FOREIGN 2009] (1)
5. What are isotonic solutions? Give one example. [AI 2012, 13] (1)
6. Of 0.1 molal solution of glucose and sodium chloride respectively, which one will have a higher boiling point? (1)
7. What are ideal solutions? Give two examples. (2)
8. Draw vapour pressure vs composition diagram for an ideal solution. (2)
9. What is meant by abnormal molecular mass? Illustrate it with suitable example (2)
10. State Raoult's law for solution containing non-volatile solutes [Delhi 2013 C] (2)
11. Distinguish between ideal and non-ideal solutions. (2)
12. State and explain Henry's law and mention its two important applications. [AI 2010C, 12C, Delhi, Foreign 2008] (2)
13. What is the molar concentration of particles in human blood if the osmotic pressure is 7.2 atm at normal body temperature of 37°C? (2)
14. If O<sub>2</sub> is bubbled through water at 393 K, how many millimoles of O<sub>2</sub> gas would be dissolved in 1L of water? Assume that O<sub>2</sub> exerts a pressure of 0.95 bar. (3)
15. The mole fraction of methanol in an aqueous solution is 0.02 and density 0.994g/cm<sup>3</sup> Determine the molality and molarity. (3)
16. An aqueous solution containing 3.12g of Barium Chloride in 250g of water is found to boil at 100.0832°C. Calculate the degree of dissociation of Barium Chloride. (Given: Molar mass BaCl<sub>2</sub>=208g/mol, K<sub>b</sub> for water=0.52K/m). (3)
17. Explain the following:-
  - (a) Aquatic species are more comfortable in cold water rather than warm water. [Delhi 2012C]
  - (b) To avoid bends scuba divers use air diluted with helium.
  - (c) Cold drink bottles are sealed under high pressure. (3)
18. Show that relative lowering of vapour pressure of a solvent is a colligative property. (3)
19. Under what conditions van't Hoff factor is (i) equal to 1 (ii) greater than 1 (iii) less than 1 (3)
20. Illustrate with the help of diagram different types of non-ideal solutions. Explain the Reason for negative and positive deviation. (5)
21. (a) The solubility of oxygen in water is 1.35x10<sup>-3</sup>mol/L at 20°C and 1 atm pressure. Calculate the concentration of oxygen at 20°C and 0.2 atm pressure.  
(b) Why do electrolytes show abnormal molecular masses? Name the factors responsible for abnormality. (5)

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**SOLUTION- UNIT -II**

**ELECTROCHEMISTRY**

1. What is meant by limiting molar conductivity? [AI 2010](1)
2. What is a Galvanic cell? (1)
3. What is the SI unit of cell constant? (1)
4. State one difference between a primary battery and secondary battery. (1)
5. Can you store zinc sulphate solution in a copper container? (1)
6. Rusting of iron become quicker in saline water.why? (1)
7. Write the name of the chemical substance which is used to prevent corrosion.(1)
8. Mention two differences between electrochemical cell and electrolytic cell? (2)
9. Why is it not possible to determine  $E^0$  for a weak electrolyte? Explain. (2)
10. The conductivity of 0.20 M KCl at 298k is 0.025 S/CM. Calculate its molar conductivity. [Delhi 2011 C, 2013] (3)
11. Explain how rusting of iron envisaged as setting up of N electrochemical cell [Delhi 2012 C] (3)
12. Zinc rod is dipped in 0.1M solution of ZnSO<sub>4</sub>. The salt is 95% dissociated at this dilution at 298k. Calculate the electrode potential. [ given  $E^0 \text{ Zn}^{2+} / \text{Zn} = -0.76 \text{ V}$ ] [Delhi 2012 C] (3)
13. Define the term Faraday constant.what is its numerical value? (1)
14. What is the use of platinum foil in hydrogen electrode? (1)
15. How can you increase the reduction potential of an electrode? (1)
16. What is conductivity water? (1)
17. Write Debye-Huckel-Onsager equation.What do different symbols signify? (1)
18. Why is chromium used for coating iron? (1)
19. what flow in the internal circuit of a galvanic cell? (1)
20. How can you test whether the given electrolyte is a strong electrolyte or a weak electrolyte?(1)
21. Why is it not possible to measure the single electrode potential? (2)
22. Why Zinc reacts with dilute H<sub>2</sub>SO<sub>4</sub> to give the gas but copper does not? (2)
23. Given an example of fuel cell and write the cathode and anode reactions for it.[AI 2006 C & 2011 C]
24. Predict the product of electrolysis when a dilute solution of H<sub>2</sub>SO<sub>4</sub> is electrolyzed with Platium electrodes. [Delhi 2007] (2)
25. What is corrosion? What are the factor which affects corrosion? CO<sub>2</sub> is always present in natural water. Explain its effect (increases, stops or no effect) on rusting of iron [Delhi 2012C] (3)
26. Which cell were used in Apollo space program?What was the product used for? (1)
27. What is overvoltage? (1)
28. What is the basic reason that a lead storage battery can be recharged? (1)
29. On the basis of  $E^0$  value which gas has highest tendency to reduce? (1)
30. List the two factors which influence the cell potential of a galvanic cell? (1)