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Code No. : 1219 N

VASAVI COLLEGE OF ENGINEERING (*Autonomous*), HYDERABAD

B.E. I Year II - Semester (New) Examinations, May - 2016

Engineering Chemistry-II

(CSE, ECE & IT)

Time: 3 hours

Max. Marks: 50

Note: Answer ALL questions in Part-A and any FIVE questions from Part-B

Part-A (15 Marks)

1. Can we store CuSO_4 in Zinc vessel? ($E_{\text{Cu}^{2+}/\text{Cu}}^0 = 0.34\text{V}$ and $E_{\text{Zn}^{2+}/\text{Zn}}^0 = -0.76\text{V}$)? Justify [1]
your answer.
2. What are the merits of fuel cells? [1]
3. What is meant by passivity? [1]
4. Explain the terms stable equilibrium and meta stable equilibrium states. [1]
5. Define a liquid crystal. [1]
6. Equivalent conductance of $\text{Al}_2(\text{SO}_4)_3$ is $224 \text{ S. cm}^2 \text{ eq}^{-1}$. Calculate its molar conductance. [2]
7. Write Nernst equation and explain the terms in it [2]
8. Iron in contact with Copper corrodes more readily than in contact with Nickel. Explain. [2]
9. Define the terms Component and Degree of freedom. [2]
10. How the physical and chemical properties of nanoparticles vary with their size? [2]

Part - B (5×7 = 35 marks)

11. a) Illustrate glass electrode and how pH of a solution is determined using the same? List the advantages of glass electrode. [4]
b) Write the cell reaction and calculate cell potential at 25°C for the cell [3]
 $\text{Pt} / \text{H}_2 (1 \text{ atm}) / \text{HCl} (0.1 \text{ M}) // \text{HCl} (0.1 \text{ M}) / \text{AgCl} / \text{Ag}$.
Given that the standard emf of the cell is 0.45 V .
12. a) Write cell notation and cell reaction of dry cell and why does a dry cell become dead after a long time, even if it has not been used? [3]
b) What are secondary cells? Illustrate the construction and the reactions of Ni-Cd battery during charging and discharging. [4]
13. a) Distinguish between differential aeration corrosion and bimetallic corrosion. [3]
b) Explain how the following factors affect the rate of corrosion? [4]
i) pH ii) Temperature iii) Humidity iv) Nature of metal
14. a) Draw the phase diagram for Pb-Ag system. How is desilverization done? [4]
b) Predict the number of components, phases and degrees of freedom in the following system [3]
 $\text{CaCO}_3(\text{s}) = \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
15. a) Explain the preparation of nanoparticles by vapour deposition method with a neatly labelled diagram. [3]
b) Discuss molecular ordering in liquid crystals. [4]
16. a) Differentiate between Galvanic cell and Electrolytic cell. [3]
b) Explain the construction and reactions taking place in lithium-ion battery. [4]
17. Write notes on any two of the following: [7]
a) Electroless plating and Electro plating.
b) One component system with Phase diagram.
c) Thermotropic and Lyotropic liquid crystals.
