Hall Ticket Number:

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VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. I Year II-Semester Advanced Supplementary Examinations, June/July-2017

Engineering Chemistry-II
(C.S.E., E.C.E. & I.T.)

Time: 3 hours Max. Marks: 50

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

Part-A (15 Marks)

1. Why corrosion of water filled steel tank occurs below the water level. [1]
2. Represent quinhydrone electrode and give its electrode reaction. [1]
3. Write the applications of phosphoric acid fuel cell. [1]
4. State and explain phase rule. [1]
5. Write the applications of membrane technology. [1]
6. Define equivalent and specific conductance. Give their interrelationship. [2]
7. Explain the principle of Sacrificial Anodic Protection of corrosion. [2]
8. Distinguish between triple point and eutectic point. [2]
9. What is phosphoric acid fuel cell? Give its applications. [2]
10. What are liquid crystals? Give two examples. [2]

Part-B (5 × 7 = 35 Marks)

11. a) What is Glass electrode? Explain the determination of pH of a solution by using it. [4]
    b) 0.05 N solution of an electrolyte occupying a volume between two platinum electrodes of 1.72cm apart and a cross sectional area of 4.5cm^2 has a resistance of 250 ohms. Calculate the equivalent conductance of the solution? [3]

12. a) Describe the construction and working of lead-acid battery and give its applications. [5]
    b) Distinguish between primary and secondary batteries. [2]

13. a) Bring out the differences between Dry and Wet corrosion. [3]
    b) Explain the following corrosion control methods: [4]
    i) Cathodic protection ii) Electroplating

14. a) Define the terms Phase and Component. Explain with a suitable example. [3]
    b) Draw a well labelled phase diagram for Lead-Silver system. Explain it by applying Phase Rule equation. [4]

15. a) What are nanomaterials? Give their important technological applications. [4]
    b) Give the classification of liquid crystals with examples. [3]

16. a) Derive Nernst equation for Metal-Metal ion electrode. Give its importance. [4]
    b) Calculate the emf of a Daniel cell at 25C when the concentration of $ZnSO_4$ and $CuSO_4$ are 0.01 M and 0.1 M respectively. The standard potential of the cell is 1.10 V. [3]

17. Answer any **two** of the following: [7]
    a) Factors that affect the rate of corrosion by the nature of metal.
    b) Applications of liquid crystals.
    c) Preparation methods of nanomaterials.

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