**(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2021-22 ONLY)**

**SUB CODE 21 PCY 3E1**

**REG.NO.**

# N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

## END-OF-SEMESTER EXAMINATIONS : DECEMBER – 2022

**M.Sc. – CHEMISTRY** **MAXIMUM MARKS: 70**

**III SEMESTER** **TIME : 3 HOURS**

## ELECTIVE – II : APPLIED ELECTROCHEMISTRY

**SECTION – A (10 X 1 = 10 MARKS)**

**ANSWER THE FOLLOWING QUESTIONS.**
**MULTIPLE CHOICE QUESTIONS. (K1)**

1. Which of the following cell is not rechargeable?
   a) Lead storage battery b) Silver oxide cell c) Fuel cell d) Ni-Cd cell
2. List of elements based on hydrogen scale is called……..
   a) Periodic table b) groups c) Periods d) Electrochemical series
3. Name of the storage battery generally used in electric power station is ……
   a) Li-Cd battery b) Zinc-Carbon battery c) Lead-Acid battery d) None of the above
4. When plating silver onto cutlery, which one of the following electrolytes would be the most suitable?
   a) $CuSO_4$ b) Ag c) $ZnSO_4$ d) $AgNO_3$
5. Name of the dry corrosion is called……..
   a) Chemical corrosion b) Electrochemical corrosion c) Wet corrosion d) Oxidation corrosion

**ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. (K2)**

6. Mention any one application of coulorimetric technique.
7. What does $Ag/Ag^+$ (0.1M) ‖ $Ag^+$ (0.1M)/Ag constitutes a cell?
8. How long should a rechargeable last?
9. What is electroless nickel plating?
10. Why do metals undergo corrosion? Give examples of corrosion of metals.

**(CONTD …. 2)**

## SECTION – B (5 X 4 = 20 MARKS)

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)**

11. a) Describe the diffusion limited current.

**(OR)**

b) Explain the principle of polarography.

12. a) Compare electro-reduction of nitro and carbonyl groups.

**(OR)**

b) Illustrate concentration cells with and without Liquid Junction Potentials.

13. a) Compare cell and battery. Give the classification of cells with examples.

**(OR)**

b) Discuss the working principle of secondary batteries.

14. a) Analyze the process of metal plating. Why is it required?

**(OR)**

b) Discuss the suitable method in electroplating of chromium.

15. a) Distinguish between sacrificial anodic and cathodic protection methods

**(OR)**

b) Discuss various methods of corrosion with neat sketches.

## SECTION - C (4 X 10 = 40 MARKS)

**ANSWER ANY FOUR OUT OF SIX QUESTIONS**

**($16^{th}$ QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS (FROM Qn. No: 17 to 21) (K4 (Or) K5)**

16. Explain conductometric titrations.

17. Elaborate the principle and application of voltammetry and cyclic voltammetry.

18. i) With an example, determine the solubility of product.

ii) Describe electrode concentration cells.

19. Explain the construction and working of $H_2$-$O_2$ fuel cell? Write the reaction in valued.

20. Discuss the Hall-Heroult process.

21. Explain the pourbaix diagram.

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