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| **MIDTERM TEST**  **CRT-05** | | | |
| **NAME :** | **CLASS: XII**  **EINSTEIN** | **SUBJECT: CHEMISTRY** | **DATE:**  **13.09.19** |
| **CH:3 – ELECTRO CHEMISTRY** | | **MARKS:** | **25** |

**I. Answer the following 5 x 1 = 5**

1. What is meant by Cell Constant?

2. HCl does not give acidic solution in benzene. Why?

3. How much of electricity is required in coulomb for the oxidation of one

mole of H2O to O2.

4. If E° cell is – ve cell will not work (True / False)

5. Represent the galvanic cell in which the reactions is

Zn(s) + Cu2+(aq) -----🡪 Cu(s) + Zn2+(aq)

**II. Short Answer Type Questions (any Three) 3 x 2 = 6**

6. Determine the values of the equilibrium constant (𝑲𝑪) and Δ𝐆𝐨 for the following reaction:

𝐍𝐢(𝐬)+𝟐𝐀𝐠+(𝐚𝐪) ⟶ 𝐍𝐢𝟐+(𝐚𝐪)+ 𝟐𝐀𝐠(𝐬),𝐄𝐨 = 𝟏.𝟎𝟓 𝐕 (𝟏𝐅 = 𝟗𝟔𝟓𝟎𝟎 𝐂 𝐦𝐨𝐥−𝟏)

7. What type of cell is a lead storage battery? Write the anode and the cathode reactions and the overall cell reaction occurring in the use of a lead storage?

8. A solution of 𝑪𝒖𝑺𝒐𝟒 is electrolyzed for 10 minutes with a current of 1.5 amperes. What is the mass of copper deposited at the cathode?

9. The chemistry of corrosion of iron is essentially an electrochemical phenomenon. Explain the reactions occurring during the corrosion of iron in the atmosphere?

**III. Brief Answer Type Questions (any Three) 3 x 3 = 9**

10. Calculate emf of the following cell at 𝟐𝟓℃ ∶

𝐅𝐞|𝐅𝐞𝟐+ (𝟎. 𝟎𝟎𝟏 𝐌)||𝐇+(𝟎. 𝟎𝟏𝐌)|𝐇𝟐(𝐠) (𝟏 𝐛𝐚𝐫)|𝐏𝐭(𝐬)𝐄𝐨(𝐅𝐞𝟐+|𝐅𝐞) = −𝟎. 𝟒𝟒 𝐕 𝐄𝐨(𝐇+|𝐇𝟐) = 𝟎. 𝟎𝟎𝐕.

11. Conductivity of 𝟐. 𝟓 × 𝟏𝟎−𝟒𝑴 Methanoic acid is 𝟓. 𝟐𝟓 × 𝟏𝟎−𝟓𝑺 𝒄𝒎−𝟏 Calculate its molar conductivity and degree of dissociation. Given: 𝝀°(𝑯+)𝟑𝟒𝟗. 𝟓𝒄𝒎𝟐𝒎𝒐𝒍−𝟏 𝒂𝒏𝒅 𝝀°(𝑯𝑪𝑶𝑶−) = 𝟓𝟎. 𝟓 𝒄𝒎𝟐𝒎𝒐𝒍−𝟏

12. The electrical resistance of a column of 0.05 M, NaOH solution of diameter 1 cm and length 𝟓𝟎𝐜𝐦 𝐢𝐬 𝟓. 𝟓𝟓𝐱𝟏𝟎𝟑𝐨𝐡𝐦. Calculate its resistivity, conductivity and molar conductivity.

13. Calculate the emf of the following cell at. 𝟐𝟓𝟎𝑪: 𝑨(𝒔)|𝑨𝒈+(𝟏𝟎−𝟑𝑴||𝑪𝒖 𝟐+(𝟏𝟎−𝟏 𝑴)|𝑪𝒖(𝒔) Give 𝑬° 𝑪𝒆𝒍𝒍 = −𝟎. 𝟒𝟔 𝑽 𝒂𝒏𝒅 𝒍𝒐𝒈 𝟏𝟎𝒏 = 𝒏

**IV. Long Answer Type Questions (any One) 1 x 5 = 5**

14. (a) State faraday’s first law of electrolysis. How much charge in terms

of Faraday’s required for the reduction of 1mol of 𝑪𝒖𝟐+ to 𝑪𝒖.

(b) Calculate emf of the following cell at 𝟐𝟗𝟖 𝑲 ∶ 𝒈 (𝒔) | 𝑴𝒈𝟐+ (𝟎. 𝟏 𝑴) || 𝑪𝒖𝟐+(𝟎. 𝟎𝟎𝟏)| 𝑪𝒖 (𝒔)

[𝑮𝒊𝒗𝒆𝒏 𝑬°𝒄𝒆𝒍𝒍 = + 𝟐. 𝟕𝟏𝑽, 𝟏 𝑭 = 𝟗𝟔𝟓𝟎𝟎 𝑪 𝒎𝒐𝒍−𝟏]

**Or**

(a) State the relationship amongst cell constant of a cell, resistance of the solution in the cell and conductivity of the solution. How is its solution? How is molor conductivity of a solute related to conductivity of its solution?

(b) A voltaic cell is set up at 𝟐𝟓𝟎𝑪 with the following half-cells:

𝑨𝒍 | 𝑨𝒍𝟑+ (𝟎. 𝟎𝟎𝟏 𝑴) 𝒂𝒏𝒅 𝑵𝒊 | 𝑵𝒊𝟐+ (𝑶. 𝟓𝟎 𝑴)

Calculate the cell voltage [𝑬°𝑵𝒊𝟐+|𝑵𝒊 = −𝟎. 𝟐𝟓 𝑽, 𝑬°𝑨𝒍𝟑+|𝑨𝒍 = −𝟏. 𝟔𝟔 𝑽 ]