Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **15CH3026** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ENVIRONMENTAL ELECTROCHEMISTRY** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Distinguish between a Galvanic and electrolytic cell with suitable example. | CO1 | 10 |
| b. | Give Guoy-Chapman-Stern theory for the structure of electrical double layer. | CO1 | 10 |
| **(OR)** | | | | |
| 2. |  | Explain in detail on the separation techniques in electroosmosis and electrophoresis. | CO1 | 20 |
|  |  |  |  |  |
| 3. | a. | Derive Nernst equation and give the significance of electrode potential. | CO2 | 10 |
| b. | Illustrate the principle of electrochemical cell and give electrochemical reaction occurring in Daniel cell. | CO2 | 10 |
| **(OR)** | | | | |
| 4. |  | Explain the Helmholtz model of electrical double layer theory and give its application. | CO2 | 20 |
|  |  |  |  |  |
| 5. | a. | Describe the water contamination by metal ions. How can we recover these metal ions electrochemically? | CO2 | 10 |
| b. | Discuss the application of electrocoagulation in groundwater and industrial wastewater treatment. | CO3 | 10 |
| **(OR)** | | | | |
| 6. |  | Derive Tafel equation to calculate overpotential. | CO2 | 20 |
|  |  |  |  |  |
| 7. |  | Construct H2-O2 fuel cell, give the mechanism and advantages and limitations of the same. What are the ways the efficiency of fuel cells can be enhanced? | CO3 | 20 |
| **(OR)** | | | | |
| 8. |  | Discuss in detail on any three electrochemical methods used for waste water purification and give their advantages and limitations. | CO2 | 20 |
|  | | **Compulsory**: |  |  |
| 9. |  | Discuss in detail the mechanism in electrocoagulation process in the removal of pollutants from wastewater and give its advantages over chemical coagulation. | CO2 | 20 |