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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **15CH3021** | **Duration :** | **3hrs** |
| **Sub. Name :** | **APPLIED 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. | What is an electrochemical corrosion? Explain it’s mechanism with suitable diagrams. | CO1 | 10 |
| b. | What is caustic embrittlement? How this can be prevented? | CO1 | 5 |
| c. | Ilustrate the mechanism of decarburization. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | What is pitting corrosion? Describe the mechanism of pitting with a diagram. | CO1 | 10 |
| b. | What is differential aeration corrosion? How does the concentration cell can form during the differential aeration corrosion? Explain with a diagram. | CO1 | 10 |
| 3. | a. | What is corrosion monitoring? What are the applications of corrosion monitoring? Explain the principle of four non-destructive testing methods used for corrosion monitoring with suitable diagrams. | CO1 | 10 |
|  | b. | Explain any five factors which can influence the rate of corrosion. | CO1 | 5 |
|  | c. | What is the role of inhibitors in the modifying the environment. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | Explain any five methods of cleaning articles before electrodeposition process? | CO1 | 10 |
|  | b. | What is chrome electroplating? Mention the stages and types of chromium electroplating process. Explain it’s bath composition? | CO1 | 10 |
| 5. | a. | Write elaborative notes on the following: (i) Anodizing, (ii) Electroforming | CO1 | 10 |
|  | b. | What is zinc electroplating? What are the steps recommended for zinc electroplating process? Explain briefly the bath composition and conditions described for effective zinc electroplating process. | CO1 | 10 |
| (OR) | | | | |
| 6. | a. | Explain the electrochemistry of Molten Carbonate Fuel Cells (MCFCs). | CO1 | 10 |
|  | b. | What is an electrode potential? Derive the Nernst equation for electrode potential. | CO1 | 10 |
| 7. | a. | Explain the construction of saturated calomel electrode (SCE). How to measure the single electrode potential of Zn using saturated calomel electrode? | CO1 | 10 |
|  | b. | How to assemble a standard hydrogen electrode? Elucidate with a diagram. | CO1 | 10 |
| (OR) | | | | |
| 8. | a. | What is a transducer? Explain the operation principle and types of various transducers? Mention few of their applications. | CO1 | 10 |
|  | b. | Write notes on macro electrodes? How to fabricate a dropping mercury electrode ? | CO1 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | What is cyclic voltammetry? Explain it’s types with suitable diagrams. | CO1 | 10 |
|  | b. | Illustrate the importance of impedance spectroscopy? Derive the basic equation for impedance. How to differentiate Nyquist plot from Bode plot? | CO1 | 10 |

ALL THE BEST