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 – April/May – 2017**

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| **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. | Define pitting corrosion? Describe the mechanism of pitting corrosion with a diagram. | CO1 | 10 |
| b. | Describedifferential aeration corrosion? Explain the formation of concentration cell during the differential aeration corrosion? Illustrate with a diagram. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Describe the principle involved in intergranular corrosion? Illustrate its mechanism. | CO1 | 10 |
| b. | Define Pourbaix diagram.Elucidate the important uses of Pourbaix diagram. | CO1 | 10 |
| 3. | a. | Define cathodic protection. Illustrate the principles involved in sacrificial anodic protection and impressed current cathodic protection methods. | CO1 | 10 |
| b. | Describe erosion corrosion. | CO1 | 5 |
| c. | Illustrate galvanic corrosion? Explain with an example. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | Define the throwing power of a bath.Explain the determination ofthe throwing power by Haring – Blum Cell. | CO1 | 10 |
|  | b. | Describe the details of different ingredients present in an electrolyte bath of an electroplating process. | CO1 | 10 |
| 5. | a. | Illustrate the roles of the following parameters in an electrodeposition process: (i) Decorative value, (ii) Temperature, (iii) Agitation, (iv) Current density (v) pH of the bath. | CO1 | 10 |
| b. | Describe the importance of electroplating of copper. Explain its bath compositions and appropriate operating conditions. | CO1 | 10 |
| (OR) | | | | |
| 6. | a. | Explain the operating principle of a fuel cell with a schematic diagram. | CO1 | 10 |
|  | b. | Describe the principle, construction, working concept, advantages and disadvantages of lithium ion batteries. | CO1 | 10 |
| 7. | a. | Define redox electrode. Explain the construction of quinhydrone electrode. How to determine the pH of a solution using quinhydrone electrode? | CO1 | 10 |
|  | b. | Illustrate the process of fabrication an internal reference electrode. | CO1 | 10 |
| (OR) | | | | |
| 8. | a. | Illustrate the working principle of photo electrochemical cells (PECs) with suitable diagrams. | CO1 | 10 |
|  | b. | Explain electrocatalysts. Explain the principle of elactrocatalysts in the reactions involving adsorbed species. | CO1 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | IllustrateTast Polarography.Describe the experimental arrangement for Tast Polarography. | CO1 | 10 |
|  | b. | Explain elaboratelyabout the following: (i) Differential pulse voltammetry, (ii) Tafel plot | CO1 | 10 |