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– 2017**

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| **Code :** | **16CH1002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **APPLIED CHEMISTRY FOR ENGINEERS** | **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. | Give the structure of EDTA. | CO1 | | 2 |
| b. | A sample water contains Ca (HCO3)2 = 162 mg/l, CaCl2 = 11.1 mg/l, MgCl2 = 190 mg/l, MgSO4 = 120 mg/l. Calculate total, permanent and temporary hardness present in it. | CO1 | | 6 |
| c. | Discuss softening of hard water by ion exchange resin method with a neat sketch. | CO1 | | 12 |
| (OR) | | | | | |
| 2. | a. | Point out the disadvantages of scale and sludge. | CO1 | | 6 |
| b. | Calculate total, temporary and permanent hardness of a water sample containing Mg(HCO3)2 = 7.3 mg/l, Ca(HCO3)2 = 16.2 mg/l, CaCl2 = 111mg/l, MgSO4 = 120 mg/l | CO1 | | 6 |
| c. | Describe how reverse osmosis is used in desalination of water. | CO1 | | 8 |
| 3. | a. | Recall the classification of polymers with suitable examples. | CO2 | | 6 |
|  | b. | List any four biomedical applications of polymers. | CO2 | | 4 |
|  | c. | Outline the synthesis, properties and uses of bakelite. | CO2 | | 10 |
| (OR) | | | | | |
| 4. | a. | Summarize the preparation, properties and uses of polyethylene. | CO2 | | 10 |
|  | b. | Prepare short notes on i. Conducting polymers ii. Biodegradable polymers. | CO2 | | 6 + 4 |
| 5. | a. | Describe the chemical composition of hair and the pigments responsible for hair colour. | CO1 | | 10 |
|  | b. | Write an essay on the role of polyaromatic hydrocarbons in human health. | CO1 | | 10 |
| (OR) | | | | | |
| 6. | a. | List the names of any five food adulterants in daily use. Identify one method of detection for each. | CO1 | | 10 |
|  | b. | Highlight the role of oxytocin and melatonin in controlling the emotions of human beings. | CO1 | | 10 |
| 7. | a. | Derive Nernst equation for single electrode potential. | CO3 | | 10 |
|  | b. | With a neat diagram explain the construction and working of a Daniel cell. Calculate the emf of Daniel cell at 25oC when the concentration of zinc sulphate and copper sulphate are 0.01M and 0.1M respectively. The standard potential of cell is 1.2 volts. | CO3 | | 7 +3 |
| (OR) | | | | | |
| 8. | a. | Identify and explain any four methods used for corrosion control. | | CO2 | 10 |
|  | b. | Some chemicals are used as peaceful weapons of chemistry. Justify the statement with three examples. | | CO3 | 10 |
|  | | **Compulsory:** | |  |  |
| 9. | a. | Comment on the statement “Nanotechnology finds applications in different fields”. | | CO3 | 10 |
|  | b. | Discuss the two approaches used in synthesis of nanomaterials in detail. | | CO3 | 10 |

ALL THE BEST