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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **17CH1002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **APPLIED CHEMISTRY** | **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. | Describe the method of softening by zeolite process with a neat diagram. | CO1 | 10 |
| b. | Calculate total, permanent and temporary hardness of a sample water containing  Ca(HCO3)2 = 81 mg/l, Mg(HCO3)2 =73 mg/l, CaSO4 = 68mg/l,MgCl2 = 95 mg/l  (Ca-40, Mg-24, S-32, Cl-35.5) | CO1 | 5 |
| c. | Give short note on carbonate and calgon conditioning. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Explain the steps involved in the purification of municipal water. | CO1 | 15 |
| b. | Calculate total, permanent and temporary hardness of a sample water containing  Ca(HCO3)2 = 162mg/l, Mg(HCO3)2 =146 mg/l,  CaSO4 = 136mg/l, (Ca-40, Mg-24, S-32, Cl-35.5) | CO1 | 5 |
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| 3. | a. | Define Cp and Cv.Derive the relationship between Cp and Cv. | CO2 | 10 |
| b. | Calculate the enthalpy of formation of ethane given that the enthalpies of combustion of carbon,hydrogen and ethane are -394, -286 and -1542 kJ/mol respectively.  Target equation  2C(s) + 3H2(g)→ C2H6(g) | CO2 | 5 |
| c. | Differentiate between intensive and extensive properties with example. | CO2 | 5 |
| (OR) | | | | |
| 4. | a. | Derive ΔG=ΔH +T(δ(ΔG)/ δT)p | CO2 | 10 |
| b. | Calculate the enthalpy of formation of carbon monoxide,given the enthalpies of combustion of carbon, carbon monoxide are -394 and  -283 kJ/mol respectively.  Target equation  C(s) + ½ O2(g) → CO(g) | CO2 | 5 |
| c. | Define the following: i) Carnot theorem ii) exothermic reaction  iii)endothermic reaction | CO2 | 5 |
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| 5. | a. | Define electrode potential. Derive Nernst equation for electrode potential. | CO3 | 10 |
| b. | Construct hydrogen-oxygen fuel cell and explain its working with a neat diagram. | CO3 | 10 |
| (OR) | | | | |
| 6. | a. | Define electrochemical cell. Describe the working of Daniel cell with a neat sketch.. | CO3 | 10 |
| b. | Calculate the emf of Daniel cell at 250C when the concentration of ZnSO4 and CuSO4 are 0.001M and 0.1M respectively. The standard electrode potential of the cell is 1.2V. | CO3 | 5 |
| c. | Write short note on the following. i) molar conductance ii) redox reaction | CO3 | 5 |
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| 7. | a. | Give an account of any five factors influencing corrosion. | CO4 | 10 |
| b. | List out the moulding constituents and mention their functions. | CO5 | 10 |
| (OR) | | | | |
| 8. | a. | Discuss the following i)oxidation corrosion ii) galvanic corrosion | CO4 | 10 |
| b. | Define the following terms i) thermoplastics ii) thermosetting plastics iii) degree of polymerization iv) polymers v) monomers | CO5 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | How will you prepare nanomaterialsby top down methods? | CO6 | 10 |
| b. | Discuss the applications of nanomaterials. | CO6 | 10 |