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



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

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| **Code :** | **18CH1005** | **Duration :** | **3hrs** |
| **Sub. Name :** | **CHEMISTRY FOR CIVIL ENGINEERING** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Marks** |
|  | | **PART - A (10X1=10 MARKS)** | | |
| 1. | The type of hydrogen bond found in p-nitro phenol is \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO1 | 1 |
| 2. | What is meant by functionality in polymers? | | CO2 | 1 |
| 3. | Epoxy resins are combination of \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | CO2 | 1 |
| 4. | Define: Nanomaterials. | | CO3 | 1 |
| 5. | State any one method for the characterization of nanomaterials. | | CO3 | 1 |
| 6. | Write an example for coagulant. | | CO5 | 1 |
| 7. | State any one method for the removal of temporary hardness. | | CO5 | 1 |
| 8. | Write any one use of thinner. | | CO4 | 1 |
| 9. | Define: Portland cement. | | CO4 | 1 |
| 10. | State any one method for the protection of concrete. | | CO4 | 1 |

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|  | | **PART – B (6 X 3 = 18 MARKS)** | | |
| 11. | State the conditions that should be satisfied for the formation of the ionic bond. | | CO1 | 3 |
| 12. | Write a note on fiber reinforced plastics. | | CO2 | 3 |
| 13. | Compare the bottom up and topdown approaches. | | CO3 | 3 |
| 14. | Calculate the temporary hardness and permanent hardness of a sample of water containing: Mg(HCO3)2 = 14.6 mg/L; Ca(HCO3)2 = 16.2 mg/L; MgCl2 = 9.5 mg/L; CaSO4 =13.6 mg/L.(At. Wt of Mg and Ca are 24 and 40 respectively). | | CO5 | 3 |
| 15. | Write a note on saponification value of an oil. | | CO4 | 3 |
| 16. | What is meant by curing of concrete? | | CO4 | 3 |

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|  | **PART - C (6 X 12= 72 MARKS)**  **(In Answer any five Questions from Q.no 17 to 23. Q.No 24 is a Compulsory Question)** | | | |
| 17. | a. | Explain the sp3 and sp2 hybridization with example. | CO1 | 8 |
| b. | What are the properties of covalent bond? | CO1 | 4 |
| 18. | a. | Draw the molecular orbital diagram of Oxygen molecule. Calculate the bond order and indicate whether the molecule is paramagnetic or diamagnetic. | CO1 | 8 |
| b. | Compare the properties of thermosetting polymers and thermoplastics | CO2 | 4 |
| 19. | a. | With a clean diagram explain injection moulding. What are their advantages and disadvantages. | CO2 | 8 |
| b. | How is polthene prepared? What are their uses? | CO2 | 4 |
| 20. | a. | Write the applications of nanomaterials in various fields. | CO3 | 8 |
| b. | Write a note on ball-milling method. | CO3 | 4 |
| 21. |  | Explain the zeolite process for the softening of waterwith a clean diagram. What are the advantages and disadvantages of zeolite process. | CO5 | 12 |
| 22. | a. | What is meant by sludge? What are its disadvantages and how can sludge formation be prevented? | CO5 | 8 |
| b. | Compare hard water and soft water. | CO5 | 4 |
| 23. | a. | Explain galvanic corrosion with mechanism. | CO6 | 8 |
| b. | Discuss the use of inhibitor to control corrosion. | CO6 | 4 |
|  | **Compulsory:** | | | |
| 24. |  | Explain the steps involved in the manufacture of Portland cement. | CO4 | 12 |