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

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**End Semester Examination – Nov/Dec - 2017**

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| **Code :** | **17CH1001** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **INSTRUMENTAL TECHNIQUES IN CHEMISTRY** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Marks** |
|  | | **PART-A(10X1=10 MARKS)** | | |
| 1. | Define: Error | | CO1 | 1 |
| 2. | Give one example for redox titrations. | | CO4 | 1 |
| 3. | Identifyan example for secondary standard. | | CO2 | 1 |
| 4. | Mention the name of the light source used in AAS. | | CO5 | 1 |
| 5. | What is SHE? | | CO3 | 1 |
| 6. | Which spectroscopic technique will be useful to determine the heavy metals present in the soil? | | CO3 | 1 |
| 7. | Define: Sensor | | CO6 | 1 |
| 8. | Mention the stationary phase of liquid-column chromatography. | | CO6 | 1 |
| 9. | Name the chromatography technique will be useful for separation amino acids. | | CO4 | 1 |
| 10. | How temporary hardness can be removed? | | CO3 | 1 |

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|  | | **PART B(5 X 3= 15 MARKS)** | | |
| 11. | Differentiate the accuracy and precision. | | CO1 | 3 |
| 12. | Compute the mean and median the analysis of calcium content in water samples are as follows: 19.4, 19.5, 19.6, 19.8, 20.1, and 20.3. | | CO5 | 3 |
| 13. | List out the desired characteristics for reference electrodes? | | CO4 | 3 |
| 14. | Differentiate absorption and emission. | | CO3 | 3 |
| 15. | Mention the different thermal methods and their application. | | CO6 | 3 |

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|  | | **PART C(5 X 15= 75 MARKS)** | | | |
| 16. | a. | | Clarify the different types of error involved in a chemical analysis? | CO1 | 10 |
| b. | | Compute the mean and medianfor the analysis of calcium content in water samples are as follows: 19.1, 19.2, 19.3, 19.4, 20.2, and 20.3. | CO1 | 5 |
|  | | (OR) | | | |
| 17. | a. | | Explain the principle and applications of volumetricanalysis. | CO4 | 10 |
| b. | | The analysis of a calcite gave the following percentage of CaO: 56.45, 57.00, 58.04, 59.08 and 60.23. The last value appears suspected. Use Q statistics table to determine if that value should be retained or reject at the 90% confidence level. (CL at 90% is 0.642). | CO1 | 5 |
| 18. | a. | | Describe the principle, diagram and application of potentiometry. | CO5 | 10 |
| b. | | Provide the desired characteristics for reference electrodes. | CO5 | 5 |
|  | | (OR) | | | |
| 19. | a. | | Describe the principle and applications of conductometry in analytical chemistry. | CO4 | 10 |
| b. | | Explain the indicator electrodes and its type. | CO5 | 5 |
| 20. | a. | | Elucidate the principle, instrumentation and application of UV-Vis Spectroscopy. | CO3 | 10 |
| b. | | Discuss on the Beer-Lambert Law. | CO3 | 5 |
|  | | (OR) | | | |
| 21. | a. | | Explain the principle, instrumentation and application Atomic Emission Spectroscopy. | CO3 | 10 |
| b. | | Illuminate electromagnetic spectrum and its application. | CO3 | 5 |
| 22. | a. | | Explain the principle and application of solid/liquid and liquid/liquid chromatography techniques. | CO6 | 10 |
| b. | | Brief the terms: i. Stationary phase; ii. Mobile phase | CO6 | 5 |
|  | | (OR) | | | |
| 23. | a. | | Explain the principle and application of ion exchange chromatography. | CO6 | 10 |
| b. | | Clarify the principle of GC. | CO6 | 5 |
| 24. | a. | | Explain the Principle and applications of Differential Thermal Analysis. | CO3 | 10 |
| b. | | How one can remove the total hardness in water? Clarify. | CO4 | 5 |
|  | | (OR) | | | |
| 25. | a. | | Explain the Principle and applications Differential Scanning Calorimetry. | CO6 | 10 |
| b. | | Clarify the food componentsare typically analyzed infood analysis. | CO6 | 5 |

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