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



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

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

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Discuss the different types of error involved in a chemical analysis. | CO1 | 14 |
| b. | The data obtained for the analysis of calcium content in water samples are as follows: 19.1, 19.2, 19.3, 19.4, 20.2, and 20.3. Determine the mean and median of the data set. | CO2 | 6 |
| (OR) | | | | |
| 2. | a. | Explain the principle, types and applications of gravimetric analysis. | CO1 | 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 rejected at the 90% confidence level. (CL at 90% is 0.642). | CO2 | 10 |
|  |  |  |  |  |
| 3. | a. | Explain the principle, diagram and application of potentiometry. | CO5 | 15 |
|  | b. | Provide the desired characteristics for reference electrodes. | CO5 | 5 |
| (OR) | | | | |
| 4. | a. | Outline the principle and applications of conductometry in analytical chemistry. | CO5 | 15 |
|  | b. | Write note on Liquid Junction Potential. | CO5 | 5 |
|  |  |  |  |  |
| 5. | a. | Explain the principle, instrumentation and application of Infrared Spectroscopy. | CO3 | 15 |
|  | b. | Discuss the Beer-Lambert law. | CO4 | 5 |
| (OR) | | | | |
| 6. | a. | Explain the principle, instrumentation and application Atomic Absorption Spectroscopy. | CO3 | 15 |
|  | b. | Elaborate electromagnetic spectrum and its application. | CO3 | 5 |
|  |  |  |  |  |
| 7. | a. | Brief the terms: i. Stationary phase; ii. Mobile phase; and  iii. Retention factor. | CO6 | 10 |
|  | b. | Explain the solid/liquid and liquid/liquid chromatography techniques and their application. | CO6 | 10 |
| (OR) | | | | |
| 8. | a. | Illustrate the principle and applications of Ion exchange chromatography. | CO6 | 10 |
|  | b. | Explain the Principle and applications of HPLC. | CO6 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Summarize the Principle and applications of Differential Scanning Calorimetry. | CO6 | 10 |
|  | b. | Give a detail account on estimation of hardness in water. | CO6 | 10 |

ALL THE BEST