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

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

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| **Code :** | **17CH3016** | **Duration :** | **3hrs** |
| **Sub. Name :** | **INSTRUMENTAL METHODS OF ANALYSIS** | **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. | The analysis of a sample yielded CaO percentages of 36.98, 36.00, 36.04, 36.18 & 36.22. The last value appears anomalous. Should it be retained or rejected at the 90% confidence level? (at 90% confidence level; when N=3, Qcri = 0.941; N=4, Qcri = 0.765, N=5, Qcri = 0.642; N=6, Qcri = 0.560). | CO1 | 5 |
| b. | List out various types of determinate and inderterminate Errors with suitable minimizing methods. | CO1 | 15 |
| (OR) | | | | |
| 2. | a. | How many significant figures do each of the following numbers have?   1. 200.06 ii) 6.030 ×10-4 iii) 7.80 × 1010   iv) 0.02670 v) 328.0 | CO1 | 5 |
| b. | The percentages of a Constituent A in a compound AB were found to be 78.32, 78.36, 78.23, 78.11, 78.12, 78.28, 78.46, 78.56, 78.39 and 78.38. Find standard deviation and coefficient variation. | CO1 | 10 |
| c. | Write a short note on complexometric titrations. | CO1 | 5 |
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| 3. | a. | Assess the principle and techniques involved in Column Chromatography. | CO2 | 10 |
| b. | Discuss gas chromatography with a neat diagram. | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Describe High Performance Liquid Chromatography with neat diagram. | CO2 | 10 |
| b. | In gas chromatographic separation of xylene, anthracene, naphthalene, and pyene the areas under the peak were noted to be 31.0, 14.5, 27.5 and 53.2. repesctively. Calculate the percentage composition of the sample. | CO3 | 6 |
| c. | Write any four advantages of thin layer chromatography over paper chromatography. | CO2 | 4 |
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| 5. | a. | Explain the thermogravimetric analysis and its applications. | CO2 | 10 |
| b. | Discuss the Emission Spectroscopy with suitable diagram. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | Enumerate the principle and applications of differential thermal analysis. | CO3 | 10 |
| b. | Discuss the differentials scanning calorimetry with suitable examples. | CO2 | 10 |
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| 7. | a. | Give a detailed account on XRD. | CO2 | 10 |
| b. | Give an account on atomic absorption spectroscopy. | CO2 | 10 |
| (OR) | | | | |
| 8. | a. | What do you understand from Scanning Electron Microscope? Give its applications. | CO3 | 10 |
| b. | “ Transmission Electron Microscopy” is useful tool to view thin specimen. Explain it with neat diagram. | CO3 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Explain water analysis with suitable examples. | CO2 | 10 |
| b. | Describe Food analysis with suitable examples. | CO2 | 10 |