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



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

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| **Code :** | **17EI2019** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ANALYTICAL INSTRUMENTATION** | **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. | Explain the different types of optical filters and radiation sources used in absorption instrument. | CO1 | 10 |
| b. | Explain the working principle of photomultipliers tube. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Explain the quantum type and the thermal type detectors in IR spectrometers. | CO1 | 15 |
| b. | Explain FTIR spectrometer and mention the major components involved in FTIR spectrometer. | CO1 | 5 |
|  |  |  |  |  |
| 3. | a. | With help of neat diagrams explain the working of the Direct Reading Spectrophotometers. | CO1 | 10 |
| b. | Explain with neat diagrams the working of Microprocessor based Spectrophotometers. | CO1 | 10 |
| **(OR)** | | | | |
| 4. | a. | Describe the working of an analyzer that can be used to estimate the content of carbon in gas. | CO5 | 15 |
| b. | Discuss the difference between atomic absorption and atomic emission spectroscopy. | CO5 | 5 |
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| 5. | a. | Explain the basic parts of gas chromatograph. | CO4 | 15 |
| b. | Mention different types of liquid chromatography. | CO4 | 5 |
| **(OR)** | | | | |
| 6. | a. | Classify the methods used for oxygen measurement and explain any one. | CO2 | 10 |
| b. | With a neat diagram, explain the gas density analyzer. | CO2 | 10 |
|  |  |  |  |  |
| 7. | a. | Describe about various electrodes for pH measurement in detail. | CO3 | 15 |
| b. | Mention any one electrochemical method of gas analyzers. | CO2 | 5 |
| **(OR)** | | | | |
| 8. | a. | Explain in brief the different mountings in emission spectroscopy. | CO2 | 15 |
| b. | Discuss the salient features of scintillation counter. | CO2 | 5 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the working of NMR spectrometer with a schematic diagram. | CO6 | 10 |
| b. | Elaborate on the working principle of Gamma camera and explain how signal processing is carried out in the camera. | CO6 | 10 |