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



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

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| **Code :** | **17BI2002** | **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. | Define Buffer. | CO1 | 4 |
| b. | Mention the types of buffers. | CO1 | 4 |
| c. | Explain the properties of GOODs buffer and the method of preparation of phosphate buffer of pH 7. | CO3 | 12 |
| **(OR)** | | | | |
| 2. | a. | Derive and explain briefly Henderson-Hasselbalch equation and its application. | CO3 | 10 |
| b. | Describe the working principle, instrumentation and applications of pH meter with a neat diagram. | CO2 | 10 |
|  |  |  |  |  |
| 3. | a. | Derive Beer–Lamberts’s Law from the fundamental considerations. | CO2 | 6 |
| b. | Illustrate the principle and apparatus system of UV spectrophotometer with its biological application. | CO2 | 14 |
| **(OR)** | | | | |
| 4. | a. | Outline the principle, instrumentation and procedure of Raman spectroscopy with a neat diagram. | CO4 | 15 |
| b. | Why is a photomultiplier tube not used as a detector at infrared wavelengths? | CO4 | 5 |
|  |  |  |  |  |
| 5. | a. | Explain in detail the principle, working procedure of affinity chromatography with necessary diagram. | CO4 | 10 |
| b. | Briefly explain the principle of Ion exchange chromatography. | CO4 | 6 |
| c. | What key properties must an analyte have in order to be quantitated using gas chromatography? | CO4 | 4 |
| **(OR)** | | | | |
| 6. | a. | Define electrophoresis. | CO4 | 3 |
| b. | Give a detailed account on the principle, instrumentation and important application of SDS-PAGE. | CO4 | 17 |
|  |  |  |  |  |
| 7. | a. | What do you understand by differential thermal analysis? | CO5 | 5 |
| b. | Illustrate the principle and working protocol of DTA in determination of thermal properties of a given product. | CO5 | 15 |
| **(OR)** | | | | |
| 8. | a. | What is radioactive isotope? | CO6 | 5 |
| b. | Explain the principle and working method of Geiger Muller Counter with a neat diagram. | CO6 | 15 |
|  | | **Compulsory**: |  |  |
|  | a. | Outline the characteristic features of High Pressure Liquid Chromatography as an analytical tool. | CO4 | 16 |
| b. | Give a schematic diagram of HPLC and GC. | CO5 | 4 |