**14EI703**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | | | | | |
| **January, 2021** | | | **Electronics and Instrumentation Engineering** | | | | |
| **Seventh Semester** | | | **Analytical Instrumentation** | | | | |
| **Time:** Three Hours | | | | **Maximum :** 60 Marks | | | |
| *Answer ALL Questions from PART-A.* | | | | | (1X12 = 12 Marks) | | |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | | | (4X12=48 Marks) | | |
| **Part - A** | | | | | | | |
| 1 | Answer all questions | | | | | (1X12=12 Marks) | |
|  | a) | List the sources for UV radiation. | | | | |  |
|  | b) | State the Lambert’s law. | | | | |  |
|  | c) | What is grating in spectroscopy? | | | | |  |
|  | d) | Why sensitive detector is required for Spectrophotometer? | | | | |  |
|  | e) | Why high intensity magnets are preferred for NMR? | | | | |  |
|  | f) | Define dead time of a GM counter. | | | | |  |
|  | g) | What is meant by Ionization? | | | | |  |
|  | h) | Compare the functions of Prisms and Gratings. | | | | |  |
|  | i) | How the ESR principle is used in Analytical Instrumentation. | | | | |  |
|  | j) | Define the term NMR. | | | | |  |
|  | k) | Give the principle of Fourier Transform IR spectrophotometer | | | | |  |
|  | l) | Give examples of Scintillating Crystals. | | | | |  |
| **Part - B** | | | | | | | |
| 2 | a) | Discuss the working of double beam ratio recording spectrophotometer. | | | | | 6 M |
|  | b) | Write about the Prisms and Monochromators in UV-Visible Spectroscopy | | | | | 6 M |
|  | | | | | | | |
| 3 | a) | Explain different sources of UV and Visible radiations. | | | | | 6 M |
|  | b) | Outline the principles of visible spectroscopy and detailed comparison of various detecting units. | | | | | 6 M |
|  | | | | | | | |
| 4 | a) | Explain the working of FT-IR Spectrophotometer with neat diagram. | | | | | 6 M |
|  | b) | Discuss the various detectors used in IR spectroscopy. | | | | | 6 M |
|  | | | | | | | |
| 5 | a) | Explain the construction and working of Clinical Flame Photometer | | | | | 6 M |
|  | b) | Write about the Emission and Recording systems of Flame Photometers. | | | | | 6 M |
|  | | | | | | | |
| 6 | a) | Describe the constructional details of ESR Spectrometer with a neat sketch. | | | | | 6 M |
|  | b) | Explain the construction and working principle of FTNMR spectrometer. | | | | | 6 M |
|  | | | | | | | |
| 7 | a) | Explain in detail about Time of Flight Mass Analyzer. | | | | | 6 M |
|  | b) | Define Electro spin? How it is used in Spectroscopy. | | | | | 6 M |
|  | | | | | | | |
| 8 | a) | Explain in detail about Instrumentation associated with X-Ray Spectroscopy. | | | | | 6 M |
|  | b) | Explain graphically the comparative operation of ionization chamber, GM counter and scintillation counter. Explain in detail the construction of a GM counter. | | | | | 6 M |
|  | | | | | | | |
| 9 | a) | Write various applications of X-Ray spectroscopy. | | | | | 4 M |
|  | b) | Exp Explain the different types of X-Ray Fluorescence spectrophotometers. | | | | | 8 M |

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