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



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

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| **Code :** | **17CH3019** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SPECTROSCOPIC METHODS FOR STRUCTURAL ELUCIDATION** | **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. | Predict λmax values of the following compounds using Woodward-Fieser rules | CO1 | 10 |
| b. | Discuss the factors affecting the λmax and intensity of absorption bands in uv-visible spectroscopy. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Explain the following with suitable example  (i) Chromophore (ii) Auxochrome (iii) Cotton effect  (iv) Octant rule (v) Axial halo ketone rule | CO1 | 10 |
| b. | Describe the Fieser-Kuhn rule with example. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Discuss the principle, instrumentation and applications of FTIR spectroscopy. | CO2 | 10 |
| b. | Explain the factors influencing vibrational frequencies. | CO2 | 10 |
| **(OR)** | | | | |
| 4. | a. | How would you distinguish between the following pairs of compounds using IR spectroscopy? | CO2 | 10 |
| b. | Explain the possible modes of stretching and bending vibrations observed in IR spectroscopy. | CO2 | 10 |
|  |  |  |  |  |
| 5. | a. | What is chemical shift? Explain various factors which are affecting the chemical shift. | CO3 | 10 |
| b. | Tetramethylsilane is used as a reference in NMR.Why? | CO3 | 10 |
| **(OR)** | | | | |
| 6. | a. | Explain the following   1. Spin – spin relaxation 2. Spin – lattice relaxation 3. Magnetic resonance 4. Coupling constant 5. 3J Coupling | CO3 | 10 |
| b. | Explain how would you distinguish between the following pairs of compounds using 1H NMR spectroscopy? | CO3 | 10 |
|  |  |  |  |  |
| 7. | a. | Discuss the principle, instrumentation and applications of NMR spectroscopy | CO3 | 10 |
| b. | Write a short note on the following   1. NOE Effect (b) COSY (c) NOESY (d) ROSEY | CO4 | 10 |
| **(OR)** | | | | |
| 8. | a. | Explain the following:   1. DEPT spectroscopy ii) HETCOR spectroscopy | CO4 | 10 |
| b. | Discuss the fragmentation pattern of 1-pentanol and cyclohexanone  obtained in Massspectroscopy. | CO5 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the following:   1. Mclafferty rearrangement 2. Nitrogen rule | CO5 | 10 |
|  | b. | Deduce the structure of the organic compound with molecular formula of C5H10O2 using the following spectrum. | CO6 | 10 |







