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



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

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| **Code :** | **12ME348** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MATERIAL CHARACTERIZATION** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | Discuss the working, construction and performance of Scanning Electron microscope with a neat sketch in detail and its outcome. | CO1 | 20 |
| **(OR)** | | | | |
| 2. | a. | Explain the functioning of differential scanning calorimetry and also list the several types of DSC. | CO1 | 10 |
| b. | State and explain Bragg’s law and explain Laue method of X-ray diffraction. | CO1 | 10 |
|  |  |  | CO1 |  |
| 3. | a. | Demonstrate the procedure adopted for microhardness testing in detail. | CO1 | 15 |
| b. | Explain the term resolving power in Optical microscopy. | CO1 | 5 |
| **(OR)** | | | | |
| 4. | a. | Explain in detail the various steps for preparation of specimen for micro examination. | CO1 | 15 |
| b. | Describe the concept of Polarisation in light. | CO1 | 5 |
|  |  |  |  |  |
| 5. |  | Explain the principle of working and construction of Electron Spectroscopy for Chemical Analysis (ESCA) with a neat sketch. | CO1 | 20 |
| **(OR)** | | | | |
| 6. | a. | Explain the general features of a TEM with a schematic diagram and describe any two methods for preparing thin electron transparent foil from bulk samples. | CO1 | 15 |
| b. | Describe the salient features of STEM in detail. | CO1 | 5 |
|  |  |  |  |  |
| 7. | a. | Describe the salient features of Gas Chromatography in detail. | CO1 | 10 |
| b. | Give several applications of Gas Chromatography. | CO1 | 10 |
| **(OR)** | | | | |
| 8. |  | Give a detailed account of determination of internal stress and lattice parameter by X ray diffraction. | CO1 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Demonstrate the Differential Thermal Analysis in detail. Also give the application of DTA. | CO1 | 15 |
| b. | Elaborate in detail the principle of operation of Auger electron microscopy. | CO1 | 5 |