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

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**End Semester Examination – Nov/Dec– 2018**

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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. |  | Marks |
| 1. | a. | Define the term numerical aperture | 5 |
| b. | Discuss the principle of polarized light microscopy used for materials characterization techniques | 15 |
| (OR) | | | |
| 2. | a. | Differentiate between knop hardness and Vickers hardness | 5 |
| b. | Explain the process and purpose of microhardness testing | 15 |
| 3. | a. | Describe the principle of operation and several parts associated with a typical diffractometer. | 15 |
|  | b. | State Braggs law | 5 |
| (OR) | | | |
| 4. | a. | Elaborate the principle of Laue method implemented in the optical microscopy with neat sketch | 15 |
|  | b. | Give the several applications of optical microcopy and explain them. | 5 |
| 5. | a. | How Tanning Electron Microscope differs from Scanning Electron microscope. | 15 |
|  | b. | Demonstrate the working principle of Tanning Electron Microscope in detail with a neat sketch | 5 |
| (OR) | | | |
| 6. | a. | Outline the working principle and working of scanning electron microscope with a neat sketch | 15 |
|  | b. | Give the several application of SEM in materials characterization | 5 |
| 7. | a. | Deduce the principle of working of X-Ray photoelectron spectroscopy in detail. | 15 |
|  | b. | Give the limitations of X-ray photoelectron spectroscopy | 5 |
| (OR) | | | |
| 8. | a. | Discuss the principle of working of Electron spectroscopy for chemical analysis. | 15 |
|  | b. | Give the typical applications of Electron spectroscopy for chemical analysis | 5 |
|  | | Compulsory: |  |
| 9. | a. | Explain the working principle of Auger electron spectroscopy in detail. | 15 |
|  | b. | Give the application of Auger electron spectroscopy | 5 |