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



**End Semester Examination – Nov/Dec– 2017**

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| **Code :** | **17PH3016** | **Duration :** | **3hrs** |
| **Sub. Name :** | **THIN FILM TECHNOLOGY** | **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. | List the different types of vacuum pumps. Mention the advantages and disadvantages of each pump. | CO1 | 5 |
|  | b. | Explain with suitable diagram the principle, instrumentation and operation of diffusion pump. | CO1 | 15 |
| (OR) | | | | |  |  | (OR) |
| 2. | a. | Describe the working principle of MC Leod gauge. | CO2 | 5 |
|  | b. | Explain the construction and working of penning gauge with suitable sketch. | CO2 | 15 |
| 3. | a. | Describe the spray pyrolysis process for thin film deposition. | CO3 | 5 |
|  | b. | Discuss the principle and working of RF sputtering technique in the deposition of thin film. Mention its advantages and disadvantages. | CO3 | 15 |
| (OR) | | | | |  |  | (OR) |
| 4. | a. | Mention the different steps in substrate cleaning. | CO3 | 5 |
|  | b. | With suitable diagram explain the construction and working of Molecular beam epitaxy. | CO3 | 15 |
| 5. | a. | Describe the process of electrochemical deposition. | CO3 | 5 |
|  | b. | With appropriate figures, explain in detail, the different types of lattice mismatch. | CO3 | 15 |
| (OR) | | | | |  |  | (OR) |
| 6. | a. | Define stress. Differentiate intrinsic and extrinsic stress and explain the role of stress in adhesion of thin films. | CO3 | 5 |
|  | b. | Explain in detail, the various steps involved in the growth of thin films. | CO3 | 15 |
| 7. | a. | With a suitable sketch, define Bragg’s law. Also mention the Debye Scherrer formula to determine the crystalline size. | CO4 | 5 |
|  | b. | Describe in detail the basic parts and working of UV-Visible spectrophotometer. Explain how to determine the transmittance and absorbance of thin films with suitable equations. | CO4 | 15 |
| (OR) | | | | |  |  | (OR) |
| 8. | a. | Define photoluminescence. Briefly explain the pre-requisites for luminescence. | CO4 | 5 |
|  | b. | Define Hall Effect and describe how this technique can be used to determine the type of charge carriers in thin films. | CO4 | 15 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Briefly discuss the various factors that should be considered during the design of thin film resistors. | CO5 | 5 |
|  | b. | Discuss in detail the different structures of thin film transistor with a neat sketch. Explain the various steps involved in fabrication of thin film transistors. | CO5 | 15 |

ALL THE BEST