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



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

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| **Code :** | **14PH2010** | **Duration :** | **3hrs** |
| **Sub. Name :** | **VACUUM AND 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. | Describe the pumping mechanism of rotary pump with suitable sketch. | CO1 | 5 |
| b. | Explain with suitable diagram, the principle, instrumentation and pumping mechanism of turbo molecular pump. | CO1 | 15 |
| (OR) | | | | |
| 2. | a. | Describe the construction of diffusion pump with a suitable sketch. | CO1 | 5 |
| b. | Explain with suitable diagram, the principle, instrumentation and pumping mechanism of cryogenic pump. | CO1 | 15 |
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| 3. | a. | Describe the principle of operation and construction of diaphragm gauge. | CO1 | 10 |
|  | b. | Explain in detail the principle, construction and working of pirani gauge with a suitable sketch. | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | Describe the principle of operation and construction of Bourdon gauge. | CO1 | 10 |
|  | b. | Explain in detail the principle, construction and working of penning gauge with a suitable sketch. | CO1 | 10 |
|  |  |  |  |  |
| 5. | a. | With a neat sketch, explain in detail the various stages in thin film growth. | CO1 | 20 |
| (OR) | | | | |
| 6. | a. | Define spray pyrolysis and explain the different steps involved in this process of thin film deposition with a suitable diagram. | CO1 | 10 |
|  | b. | Describe the sol-gel method in material processing with suitable sketch. List the advantages and applications of this process. | CO1 | 10 |
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| 7. | a. | Explain the determination of transmittance and absorbance of thin films using UV- Visible spectrophotometer with suitable equations and a schematic sketch of the instrument. | CO3 | 20 |
| (OR) | | | | |
| 8. | a. | Define Bragg’s law. Describe how the structure of a material and the particle size are determined by X- ray diffraction studies. | CO3 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Discuss in detail the different structures of thin film transistor and the various steps involved in fabrication of thin film transistors. | CO2 | 15 |
|  | b. | Mention the role of different layers in a thin film solar cell with a suitable schematic diagram. | CO2 | 5 |