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



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

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| **Code :** | **16NT1001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **EVOLUTION OF MATERIALS** | **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 coordination number and atomic packing factor for simple cubic, body centered and face centered cubic systems. | CO1 | 6 |
| b. | Mention the classification of materials with suitable examples. Classify minimum 10 materials you use in daily life. | CO1 | 14 |
| **(OR)** | | | | |
| 2. | a. | List the different types of packaging materials with suitable examples. | CO4 | 6 |
| b. | Discuss the evolution of materials in aircraft and describe the desirable characteristics of aircraft materials. | CO3 | 14 |
|  |  |  |  |  |
| 3. | a. | Describe I-beams. Mention their use in girders and as rails in railway tracks. | CO2 | 6 |
| b. | With a neat sketch, describe the seven different crystal systems with their lattice parameters and angles. | CO2 | 14 |
| **(OR)** | | | | |
| 4. | a. | With a neat sketch, describe the process of making silicon wafers. | CO5 | 6 |
| b. | Explain in detail, the different types of defects in materials. | CO2 | 14 |
|  |  |  |  |  |
| 5. | a. | Define Young’s modulus. Describe the application of its knowledge in construction. | CO2 | 6 |
| b. | Describe the production of carbon fiber and mention its applications. | CO2 | 14 |
| **(OR)** | | | | |
| 6. | a. | Explain the synthesis and application of epoxy resin. | CO3 | 6 |
| b. | With a neat sketch, describe the process of nanoindentation and mention its applications. | CO5 | 14 |
|  |  |  |  |  |
| 7. | a. | Explain the preparation of MR fluid and metion its application. | CO2 | 6 |
| b. | Define Hall effect. Briefly explain the theory of Hall effect and mention its applications. | CO6 | 14 |
| **(OR)** | | | | |
| 8. | a. | Briefly discuss the working principle of scanning electron microscope. | CO6 | 6 |
| b. | Explain in detail the principle, construction and working of atomic force microscope. | CO6 | 14 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Define a smart building and mention its characteristics. | CO5 | 6 |
| b. | Describe the properties of graphene and mention its applications. | CO5 | 14 |