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



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

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14NT2008** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MATERIALS SCIENCE AND ENGINEERING –II** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
|  | a. | Write short notes on welding. | CO1 | 2 |
| b. | Explain why do metals have high conductivity? | CO1 | 3 |
| c. | Is powder metallurgy process suitable for metals having low ductility? If yes, why? | CO1 | 3 |
| d. | Explain the following heat treatment processes i. annealing, ii. quenching and iii. precipitation hardening. | CO1 | 12 |
| (OR) | | | | |
|  | a. | Compare and contrast annealing and quenching processes. | CO2 | 3 |
| b. | Mention the factors that determines the production of martensitic microstructure during heat treatment of steel? | CO1 | 3 |
| c. | List the different metal fabrication techniques? With suitable sketch explain in detail the different forming operations used in metal fabrication. | CO1 | 14 |
|  |  |  |  |  |
| 3. | a. | Define the term “Thermal shock”. | CO2 | 2 |
|  | b. | Write short notes on slip casting. | CO1 | 3 |
|  | c. | List the different molding techniques employed to mold polymers. | CO1 | 3 |
|  | d. | Explain in detail, the different particulate forming processes in ceramic fabrication techniques. | CO1 | 12 |
| (OR) | | | | |
| 4. | a. | Is it possible to have zero or negative thermal expansion? How? | CO2 | 3 |
|  | b. | Explain why ceramics and polymers are poor conductors of heat. | CO2 | 3 |
|  | c. | With a neat sketch, explain in detail the stress-strain behavior of brittle polymer, plastic polymer and elastomer. | CO1 | 14 |
|  |  |  |  |  |
| 5. | a. | Define polydispersity index. | CO2 | 2 |
|  | b. | Define the term “negative thermal expansion”. Give an example for material with negative thermal expansion. | CO2 | 3 |
|  | c. | Compare and contrast thermoplastics and thermosetting plastics. | CO1 | 7 |
|  | d. | Explain in detail, the different production methods of composite materials. | CO1 | 8 |
| (OR) | | | | |
| 6. | a. | What is a composite material? Give examples for natural and synthetic composites. | CO1 | 3 |
|  | b. | Does the melting point of polymers depend on its molecular weight? If yes, how and why? | CO1 | 3 |
|  | c. | Explain in detail the different types of polymer synthesis. | CO1 | 4 |
|  | d. | With suitable sketch, differentiate fiber reinforced composites based on the alignment of fibers. | CO1 | 10 |
|  |  |  |  |  |
| 7. | a. | What are cooper pairs? Where are they found? | CO2 | 4 |
|  | b. | Differentiate intrinsic and extrinsic semiconductors. Give examples. | CO3 | 6 |
|  | c. | Briefly discuss ferroelectricity and piezoelectricity with suitable examples. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Differentiate super conductivity and semiconductivity. | CO3 | 4 |
|  | b. | Is it possible to induce electrical conduction in polymers? Explain. | CO2 | 3 |
|  | c. | Define dielectric strength. | CO2 | 3 |
|  | d. | Define pyroelectricity. | CO3 | 2 |
|  | e. | Discuss in detail, the difference between dia, para and ferro magnetic materials. | CO1 | 8 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Briefly discuss on Ryleigh scattering and Tyndall scattering? | CO1 | 4 |
|  | b. | Define thermal shock resistance? How can it be improved? | CO2 | 4 |
|  | c. | Discuss in detail, the optical properties of metals and non-metals. | CO3 | 12 |

ALL THE BEST