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



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

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| **Code :** | **16NT2005** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MATERIALS SCIENCE II** | **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. | What is the use of gating system in sand casting? | CO1 | 2 |
| b. | Which type of powder pressing is utilized when high densities without appreciable grain growth are desired? Why? | CO1 | 2 |
| c. | What are the three factors that determine the production of martensitic microstructure during heat treatment of steel? | CO2 | 2 |
| d. | Explain in detail, the different types of heat treatment processes for metals. | CO1 | 14 |
| (OR) | | | | |
| 2. | a. | Which type of powder pressing procedure need not be followed by a firing process? Why? | CO1 | 2 |
| b. | Explain why do metals have high conductivity? | CO2 | 2 |
| c. | Cite two advantages of powder metallurgy over casting. | CO1 | 2 |
| d. | What are the different metal fabrication techniques? With suitable sketch explain in detail the different forming operations used in metal fabrication. | CO2 | 14 |
|  |  |  |  |  |
| 3. | a. | Write short notes on slip casting. | CO1 | 2 |
|  | b. | Briefly discuss the electrical conduction in ionic ceramics. | CO2 | 2 |
|  | c. | Briefly explain why glass–ceramics may not be transparent. | CO1 | 2 |
|  | d. | What are the different ceramic fabrication techniques? With suitable sketch explain in detail the different glass forming processes. | CO1 | 14 |
| (OR) | | | | |
| 4. | a. | Briefly explain why glass–ceramics may not be transparent. | CO1 | 2 |
|  | b. | Briefly explain the process of forming continuous glass fibers. | CO1 | 2 |
|  | c. | Mention the factors that affects the degree of vitrification. | CO1 | 2 |
|  | d. | Explain in detail, the different particulate forming processes in ceramic fabrication techniques. | CO1 | 14 |
| 5. | a. | Define the term “degree of Polymerization”. | CO1 | 2 |
|  | b. | Write short notes on condensation polymerization. | CO1 | 3 |
|  | c. | Compare and contrast thermoplastics and thermosetting plastics. Give examples. | CO1 | 7 |
|  | d. | Draw the specific volume Vs temperature plot for a crystalline polymer and amorphous polymer. Explain the difference between them. | CO2 | 8 |
| (OR) | | | | |
| 6. | a. | List the different molding techniques employed to mold polymers. | CO1 | 2 |
|  | b. | Are polymers conductors? If not, can it be made conductors? | CO2 | 2 |
|  | c. | Does the melting point of polymers depend on its molecular weight? If yes, how and why? | CO1 | 2 |
|  | d. | Mention the classification of polymeric materials. Discuss in detail the mechanical behavior of polymers with suitable stress-strain diagram. | CO1 | 14 |
|  |  |  |  |  |
| 7. | a. | What is a composite? Give one example for natural and synthetic composite. | CO1 | 2 |
|  | b. | Briefly explain the role of the two different phases in a composite material. | CO1 | 2 |
|  | c. | Define piezoelectricity. Give examples for piezo electric materials. | CO2 | 2 |
|  | d. | Mention the classification of composites. Discuss any two in detail. | CO1 | 14 |
| (OR) | | | | |
| 8. | a. | Differentiate electronic and ionic conduction. | CO2 | 2 |
|  | b. | Mention the classification of materials based on their conductivity. Give examples. | CO2 | 4 |
|  | c. | Explain in detail, the different production methods of composite materials. | CO1 | 7 |
|  | d. | Explain in detail, the different types of fiber reinforced composites based on the alignment of fibers. | CO1 | 7 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Define Ryleigh scattering. | CO3 | 2 |
|  | b. | Define thermal shock resistance. | CO2 | 2 |
|  | c. | Define thermal conductivity. Briefly discuss the conduction mechanism in ceramics. | CO2 | 4 |
|  | d. | Discuss in detail, the optical properties of metals and non-metals. | CO3 | 12 |

ALL THE BEST