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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April/May– 2017**

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

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

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
|  | a. | Explain why do metals have high conductivity. | CO2 | 3 |
| b. | Explain the use of gating system in sand casting. | CO1 | 3 |
| c. | List the different metal fabrication techniques? With suitable sketch explain in detail the different casting operations used in metal fabrication. | CO1 | 14 |
| (OR) | | | | |
| 2. | a. | Compare and contrast annealing and quenching processes. | CO1 | 2 |
| b. | Write short notes on welding. | CO1 | 2 |
| c. | Mention the type of powder pressing procedure need not be followed by a firing process? Why? | CO1 | 2 |
| d. | Mention the different ceramic fabrication techniques? With suitable sketch explain in detail the different glass forming processes. | CO1 | 14 |
| 3. | a. | Briefly discuss the electrical conduction in ionic ceramics. | CO2 | 3 |
|  | b. | Write short notes on slip casting. | CO1 | 3 |
|  | c. | Write short notes on ceramic materials? Discuss in detail about the clay products and refractories. | CO1 | 14 |
| (OR) | | | | |
| 4. | a. | Define polydispersity index. | CO1 | 2 |
|  | b. | Briefly discuss the Mathiessens rule of resistivity. | CO2 | 2 |
|  | c. | Briefly explain why glass–ceramics may not be transparent. | CO1 | 2 |
|  | d. | Mention the classification of composites. Discuss the particulate composites in detail. | CO1 | 14 |
| 5. | a. | Mention the factors that affects the degree of vitrification. | CO1 | 3 |
|  | b. | Write short notes on condensation polymerization. | CO1 | 3 |
|  | c. | Compare and contrast thermoplastics and thermosetting plastics. | CO1 | 6 |
|  | d. | Explain in detail, the different production methods of composite materials. | CO1 | 8 |
| (OR) | | | | |
| 6. | a. | Define the term “Thermal shock”. | CO2 | 2 |
|  | b. | List the different molding techniques employed to mold polymers. | CO1 | 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. | Mention the constituents of a composite. Give one example for natural and synthetic composite. | CO1 | 2 |
|  | b. | Define pyroelectricity. Give examples for pyro electric materials. | CO2 | 2 |
|  | c. | Briefly discuss ferroelectricity and piezoelectricity with suitable examples. | CO2 | 2 |
|  | d. | Discuss in detail, the difference between dia, para and ferro magnetic materials | CO2 | 14 |
| (OR) | | | | |
| 8. | a. | Differentiate electronic and ionic conduction. | CO2 | 3 |
|  | b. | Mention the classification of materials based on their conductivity. | CO2 | 3 |
|  | c. | With suitable sketch, differentiate fiber reinforced composites based on the alignment of fibers. | CO2 | 14 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Define Rayleigh and Tyndal scattering. | CO3 | 5 |
|  | c. | Discuss in detail, the optical properties of metals and non-metals. | CO2 | 15 |

ALL THE BEST