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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

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

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **09ME257/ 12ME201/ME283** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **MATERIAL SCIENCE & ENGINEERING** | **Max. marks :** | **100** |

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| Q. No. | Questions | Marks |
| **PART-A(10X1=10 MARKS**) | | |
| 1. | What is allotropy? | 1 |
| 2. | Define coordination number. | 1 |
| 3. | What is tilt angle? | 1 |
| 4. | \_\_\_\_\_\_\_\_\_\_\_ grains make the metal less tough. | 1 |
| 5. | What is endurance limit? | 1 |
| 6. | What are stress raisers? | 1 |
| 7. | Define transient creep. | 1 |
| 8. | A \_\_\_\_\_\_\_\_\_\_\_ is a physically and chemically homogeneous portion of a system, separated from the other portions of a surface, the interface. | 1 |
| 9. | List the outcome of heat treatment. | 1 |
| 10. | What is normalizing? | 1 |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11 | Compare the atomic packing factor of F.C.C & B.C.C | 3 |
| 12 | Briefly explain the operation of the Frank Reed source of dislocations. | 3 |
| 13 | Distinguish between edge and screw dislocation. | 3 |
| 14 | Explain the substitutional solid solution and interstitial solid solution with neat sketch. | 3 |
| 15 | Explain the difference between high hardenability and high hardness. | 3 |

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| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. | a. | Discuss briefly about FCC Structure with examples. | 8 |
| b. | Give a detailed account of classification of engineering materials and give one application for each material. | 7 |
| (OR) | | | |
| 17. |  | With neat sketches, describe how Miller indices of planes and directions are determined. | 15 |
| 18. |  | State and explain Fick’s Law of diffusion. Also give neat sketches of one point defect and one line defect. | 15 |
| (OR) | | | |
| 19. |  | Explain briefly the following: |  |
| a | Theory of dislocation | 8 |
| b | Role and significance of dislocation | 7 |
| 20. |  | Discuss creep resistant materials. Also indicate methods to increase the fatigue strength of metals and materials. | 15 |
| (OR) | | | |
| 21. | a. | Explain various types of brittle fracture with examples | 7 |
| b. | Explain S N curve? | 8 |
| 22. | a. | What is an equilibrium diagram? State its importance and objectives. | 7 |
| b. | State Gibb phase rule. What is its importance/utility? | 8 |
| (OR) | | | |
| 23. |  | Explain Fe-C equilibrium diagram with neat sketches. |  |
| 24. |  | What is hardening ?Explain the Jominy end quench test used to determine hardenability of steel. |  |
| (OR) | | | |
| 25. |  | Write short notes on |  |
| a. | Case hardening | 5 |
| b. | Nitriding | 5 |
| c. | Induction hardening | 5 |

ALL THE BEST