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

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

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| **Code :** | **18ME3013** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ENGINEERING MATERIALS AND APPLICATIONS** | **Max. Marks :** | **100** |

**ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain the phenomenon of plastic deformation in detail. | CO2 | 10 |
| b. | Explain the concept of slip and dislocation. | CO2 | 6 |
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| 2. | a. | What are maraging steels? How maraging steels posses high strength when compare to other steels? | CO3 | 6 |
| b. | Describe the properties and characterisitics of HSLA steels, dual phase steels and duplex stainless steels. | CO3 | 10 |
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| 3. | a. | Distinguish between ductile and brittle fracture. | CO1 | 6 |
| b. | Highlight on ductile brittle transition fatique in detail. | CO4 | 10 |
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| 4. | a. | Explain the process of pultrusion in manufacturing of composites. | CO6 | 10 |
| b. | Discuss the structure and types of several smart materials. | CO5 | 6 |
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| 5. | a. | Mention the properties of ceramic matrials. | CO5 | 6 |
| b. | Discuss the new materials for energy production, transmission, saving and harvesting. | CO5 | 10 |
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| 6. | a. | Discuss the importance of bio-compatiable materials for medical implants in detail. | CO6 | 10 |
| b. | Give the characterisitics of piezoelctirc materials and its applications in detail. | CO6 | 6 |
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| 7. | a. | Explain the several steps followed in powder metallurgy techniques in detail. | CO5 | 10 |
| b. | Give the several classification of composite materials in detail. | CO5 | 6 |
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| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. | a. | Discuss the resin transfer moulding process in the manufacturing of composite matrials in detail with a neat sketch. | CO5 | 10 |
| b. | List the several advantages of metal matrix composite. | CO6 | 10 |