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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **17ME3005** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ENGINEERING MATERIALS AND APPLICATIONS** | **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. | Discuss the elasticity and elastic behavior. | CO2 | 10 |
| b. | Explain the three models of slip with suitable diagrams. | CO2 | 10 |
| (OR) | | | | |
| 2. | a. | Define creep and also discuss the stages of creep deformation. | CO2 | 10 |
| b. | Explain the different mechanism or methods of creep deformation. | CO2 | 10 |
|  |  |  |  |  |
| 3. | a. | Define fracture strength and draw the corresponding stress-strain graph. | CO4 | 4 |
| b. | Evaluate the ductile and brittle properties of material. | CO4 | 16 |
| (OR) | | | | |
| 4. | a. | Discuss the factors influencing stress intensity factor and analyse the different methods to arrive stress intensity factor. | CO3 | 10 |
| b. | Evaluate the ductile brittle transition fatigue of materials. | CO3 | 10 |
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| 5. | a. | Assess the working principle of steel wire patenting. | CO3 | 10 |
| b. | Enumerate how the mechanical properties of steel is improved by precipitation method. | CO3 | 10 |
| (OR) | | | | |
| 6. | a. | Discuss the precipitation hardening of aluminium alloys. | CO5 | 10 |
| b. | Justify the use of maraging steel as engineering structural material  by stating its constituents, properties and application. | CO5 | 10 |
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| 7. | a. | Define shape memory alloy and also write about one way memory effect and two way memory effect. | CO5 | 10 |
| b. | Write about the crystal structure and manufacturing methods of shape memory alloys. | CO5 | 10 |
| (OR) | | | | |
| 8. | a. | Evaluate the mechanical,metallurgical properties and applications of TRIP steel. | CO1 | 10 |
| b. | Discuss the various ceramic srructures. | CO4 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Enumerate the constituents and classifications of composite materials. | CO5 | 14 |
| b. | List out applications of metal matrix composites and polymer matrix composites. | CO1 | 6 |