

1021**Code : 20ME11T****Register
Number**

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I Semester Diploma Examination, December-2023**MATERIALS FOR ENGINEERING****Time : 3 Hours]****[Max. Marks : 100**

- Instructions :** (i) Answer any **one** full question from each Section – I, II, III, IV & V.
(ii) Each one full question carries **20** marks.

SECTION – I

1. (a) Explain any three mechanical properties of metals. **6**
(b) Write a neat sketch of Scanning Electron Microscope. **4**
(c) Explain with example BCC and FCC structure for metallic elements. **10**
2. (a) Explain the classification of Engineering materials. **6**
(b) Explain with neat sketch of Transmission Electron Microscope. **4**
(c) Explain the steps involved in Metallographic specimen preparation. **10**

SECTION – II

3. (a) Classify Cast Iron. **4**
(b) State the purposes of alloying of steels. **6**
(c) Explain HS Stainless Steel. **4**
(d) List the general uses of H.S. Stainless Steel. **6**
4. (a) Classify Steel. **4**
(b) Select relevant steel with justification for the following : **6**
(i) Axle
(ii) Agricultural Equipments
(iii) Antifriction Bearings
(c) Explain High speed tool steels. **4**
(d) List properties and uses of high speed tool steels. **6**



SECTION – III

5. (a) List the properties and uses of Brass. 10
(b) List the different alloys of Nickel. 6
(c) Explain any two types of Smart materials. 4
6. (a) List any five properties and uses of Aluminium. 10
(b) Classify Bearing materials and state their properties. 6
(c) List the uses of Ceramics. 4

SECTION – IV

7. (a) List the applications of Nano materials. 4
(b) Write a note on structural composites. 6
(c) Sketch Iron Carbon diagram for mild steel by indicating all phase transformations. 10
8. (a) List the application of Bio materials. 4
(b) Distinguish between Thermoplastic and Thermosetting plastic. 6
(c) Define Heat treatment, list the purposes of Heat treatment. 10

SECTION – V

9. (a) Which process is used to soften the mild steel ? Explain. 6
(b) Compare Electrolytes and non-electrolytes. 4
(c) Explain the working of Electrochemical cell with a diagram. 10
10. (a) Explain the process of case hardening. 6
(b) Compare Electrochemical Series and Galvanic Series. 4
(c) Explain corrosion with examples. List the reasons for corrosion. How corrosion is protected ? 10
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