Code : 20ME11T

1399

Register Number

I Semester Diploma Examination, August/September-2022

MATERIALS FOR ENGINEERING

Time : 3 Hours] **[Max. Marks : 100**

Instructions : (i) Answer any **one** full question from each Section.
(ii) **One** full question carries **20** marks.

SECTION – 1

1. (a) Classify Engineering materials with examples. **8**
   (b) List any six mechanical properties of metals. **6**
   (c) Sketch and explain FCC crystal structure. **6**

2. (a) Explain Ferrous and Non-ferrous metals with examples. **4**
   (b) Sketch and explain Transmission Electron Microscope (TEM). **8**
   (c) Sketch and label the parts of a Electro-Chemical cell. **8**

SECTION – 2

3. (a) List the different types of Cast Iron. **4**
   (b) Mention the types of metal used for making the following components and justify your answer : **8**
   (i) Agricultural Equipments
   (ii) Antifriction Bearings
   (c) Indicate the meaning of following designations : **8**
   (i) Fe 250 (ii) 55 C4
   (iii) FeE 300 (iv) BM 300

4. (a) Write the classification of steel. **6**
   (b) State the purpose of Alloying. **6**
   (c) Mention the type of stainless steel with its properties for following applications : **8**
   (i) Household utensils
   (ii) Surgical instruments

SECTION – 3

5. (a) Differentiate between Brass and Bronze. 6

(b) State any three (3) properties and two (2) uses of following metals : 10

(i) Copper

(ii) Aluminium

(c) Explain Self-lubricating bearings. 4

6. (a) Give classification of polymers. 10

(b) State any five properties of ceramics. 5

(c) Explain the designation of plastics. 5

SECTION – 4

7. (a) List any four (4) applications of Smart materials. 4

(b) Differentiate between Thermosetting and Thermoplastic materials. 10

(c) Suggest an advanced material for medical application. Justify your answer. 6

8. (a) Distinguish between interstitial and substitutional solid solution. 4

(b) Sketch Iron-Carbon Equilibrium diagram indicating various phases. 10

(c) List the different types of Heat treatment process. 6

SECTION – 5

9. (a) State the purpose of Heat treatment. 8

(b) Distinguish between Annealing and Normalizing. 8

(c) Suggest a suitable heat treatment process during the manufacturing of laminated springs. Justify your answer. 4

10. (a) List different types of corrosion. 4

(b) Differentiate between Electrolyte and Non-electrolyte. 6

(c) Explain with a neat sketch Electroplating process. 10