

Makeup Examination – Sept. 2023
I Semester Diploma Examination

MATERIALS FOR ENGINEERING (20ME11T)

Exam Date / Time: 20th Sep. 2023 / 2.00 PM

Time: 3 Hours

Max.Marks: 100

- Instructions:** (1) Answer one full question from each section.
(2) One full question carries 20 marks.

SECTION - I

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| 1. a) Explain any Five Mechanical properties of metals. | 10 |
| b) With sketch write short note on BCC and HCP structures. | 10 |
| 2. a) Mention classification of steels. | 6 |
| b) Explain how cast iron is produced. List any five application of Cast Iron. | 10 |
| c) List any four application of High speed steel. | 4 |

SECTION – II

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| 3. a) Discuss the designation of steels? Indicate the meaning of following designated materials | 8 |
| i) 55 C4 | |
| ii) Fe 350 | |
| iii) FG 200 | |
| b) List the types and composition of steels used in the manufacturing of springs. | 6 |
| c) Which steel is used of the manufacturing of Bolt, Nut? Justify your selection. | 6 |
| 4. a) What are the alloys of copper? Explain the composition and Properties of any one copper alloy. | 8 |
| b) Differentiate between Ferrous and Non-Ferrous materials | 6 |
| c) What is Inconel? List its properties and applications. | 6 |

SECTION - III

5. a) Describe the Properties and applications of Aluminium 6
b) List the essential characteristics of a Bearing materials. 4
c) What do you mean by "Polymer"? Classify polymers. 6
d) Give any four important properties of Ceramics. 4
6. a) Enumerate the Properties and uses of Composite materials 6
b) What do you mean by Smart materials? Write a note on Shape memory alloy 4
c) Differentiate between Thermosetting Plastics and Thermoplastics 6
d) Discuss the classification of Bio materials. 4

SECTION - IV

7. a) Define Nano materials? Give any 4 applications of Nano materials. 6
b) Discuss how plastics are designated. 4
c) Draw the Iron-Carbon Equilibrium diagram and label all regions in it. 10
8. a) Define Heat treatment of steels. Write any 5 purpose of Heat treatment 8
b) Distinguish between Annealing and Normalizing 6
c) Differentiate between Hardening and Tempering 6

SECTION - V

9. a) Discuss any two types of Case hardening heat treatment process 6
b) List various reactions occurs in Iron - Carbon Phase diagram. Write any one reaction 4
c) What do you mean by Corrosion. List the classification of corrosion 6
d) Differentiate between Dry corrosion and Wet Corrosion 4
10. a) List various Surface protection treatments. Explain any one method. 6
b) Differentiate between Electrolyte and Non Electrolyte 4
c) With a neat sketch explain Electrochemical Cell 6
d) List the methods used to Prevent and control corrosion 4