

2209T135

**D.Voc Mechanical Manufacturing**  
**Subject: Materials and Metallurgy**  
**Subject Code: ME-504**  
**Semester: Fifth**  
**Session: - Sept. 2022**  
**Theory (External): 35 Marks**  
**Time: 03 Hours**

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**Instructions to the Students**

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 01 marks.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 05 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

**Roll Number**

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**SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)**  
(10x01=10 Marks)

- A. What is the difference between metals and non-metals?
- B. What is cast iron?
- C. What is amorphous solid? Give its one example.
- D. Define creep.
- E. What is lever rule?
- F. What is the effect of grain size on tensile strength of the material?
- G. Write any two applications of silicon steel.
- H. What is alpha and delta iron?
- I. How martensitic transformation takes place?
- J. What are the names of various instruments used to measure the temperature of a furnace.

**SECTION -B (ESSAY TYPE QUESTIONS)**  
(5x05=25 Marks)

1. Discuss the various physical and mechanical properties of the materials.
2. What is the difference between stress-strain curve of a ferrous and non-ferrous material? Discuss its salient features also.

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3. Describe the Cu-Ni isomorphs system with the help of equilibrium phase diagram along with the development of microstructure during cooling of Cu-Ni alloy.
4. Discuss the basic process of making of steel from pig iron.
5. Draw iron carbon equilibrium diagram. Discuss the characteristics of phases present in the diagram.
6. Define fatigue. Discuss the various types of loading used in fatigue failure.
7. Discuss the properties and use of any three alloys of aluminum.
8. What is the difference between hardness and hardenability? How hardenability of a material can be improved?

==END OF PAPER==