

Roll No. ....

**OLE-24049**

**B. Tech. 3rd Semester (MAE)  
Examination – April, 2021**

**MATERIAL SCIENCE**

**Paper : ME-207-F**

*Time : Three Hours ]*

*[ Maximum Marks : 100*

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*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

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**Note :** Attempt *five* questions in total selecting at least *one* question from each Section. Question No. **1** is *compulsory*. All questions carry equal marks.

1. All parts carry equal marks :  $4 \times 5 = 20$
- (a) Define the Atomic Packing Factor.
  - (b) Define the Gibbs's Phase Rule.
  - (c) Define the Strain Ageing.
  - (d) Define the Prevention of Corrosion.

## **SECTION – I**

2. What is Material science and Crystallography ? Also explain space lattice, crystal planes and crystal directions, co-ordination number. 20
3. Write a short note on Crystal imperfections and their classifications ? 20

## **SECTION – II**

4. What is Lever rule ? Also explain TTT and iron carbon equilibrium diagram in details. 20
5. What is Heat Treatment ? Also explain Normalizing, Hardening, Tempering, Carburizing, Nitriding, Cyaniding, flame and induction hardening ? 20

## **SECTION – III**

6. Write short note on : 20
  - (a) Work Hardening
  - (b) Bauschinger Effect
  - (c) Season Cracking
  - (d) Re-Crystallization and Grain Growth

7. Explain concept and types of fracture, Also define fatigue and mechanism of fatigue. 20

#### **SECTION – IV**

8. What is Creep Curve ? What is the Mechanism of Creep ? Explain the impact of time and temperature on creep. 20
9. What is Polymers ? How the formation of polymers occurs and also explain Ceramic materials with their types of ceramics. 20
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