

**432**

**B. Tech. EXAMINATION, 2020**

(Fourth Semester)

(Old Scheme) (Re-appear Only)

**MATERIAL SCIENCE**

**ME204**

*Time : 3 Hours]*

*[Maximum Marks : 100*

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

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**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit.

**Unit I**

1. (a) Explain crystal structure, crystal lattice and bravais space lattice. **13**  
(b) Define atomic packing factor. **7**
2. (a) What are crystal imperfections ? Also explain their classification. **12**  
(b) Define dislocation and their two types. Also explain one type of dislocation is known as screw dislocation. **8**

**Unit II**

3. (a) Discuss phase diagram. **10**  
(b) Describe Gibb's rule, how this rule is applied to pure metal and binary alloys. **10**
4. Define heat treatment and discuss classification of heat treatment processes. **20**

### **Unit III**

5. (i) How elastic deformation occurs and explain its effects. **10**  
(ii) Write short notes on the following : **10**  
(a) Recrystallization  
(b) Grain growth.
6. (i) What is fracture and state the causes of fracture in a metal. **10**  
(ii) State the mechanism of fatigue and factors affecting fatigue. **10**

### **Unit IV**

7. (i) What is the mechanism of creep failure ? **8**  
(ii) What is corrosion its mechanism and effects, how it can be prevented ? **12**
8. Write short notes on the following : **20**  
(i) Formation of polymers  
(ii) Ceramic forming technique.  
(iii) Types of ceramics