

Roll No. ....

**24049**

**B. Tech. 3rd Semester (MAE)**

**Examination – December, 2018**

**MATERIAL SCIENCE**

**Paper : ME-207-F**

***Time : Three Hours ]***

***[ Maximum Marks : 100***

*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.*

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

1. (a) Space Lattice
- (b) Gibb's phase rule.
- (c) Season Cracking.
- (d) Properties of Ceramic. 5 × 4 = 20

**SECTION – A**

2. Discuss about :

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P. T. O.

- (a) Co-ordination number 10  
(b) Crystal lattice and directions. 10
3. (a) Describe edge and screw dislocations in detail. 10  
(b) Explain surface defects in detail. 10

### SECTION – B

4. (a) Write about importance and objectives of phase diagram. 10  
(b) Explain iron carbon equilibrium diagram with neat sketch. 10
5. Explain the principles, classifications, purpose of heat treatment processes in brief, with neat sketches. 20

### SECTION – C

6. (a) Describe the concept of re-crystallization and grain growth. 10  
(b) Explain in detail yield point phenomena with neat sketch. 10
7. Write about :
- (a) Fracture process and analysis in metals. 10  
(b) Mechanism of fatigue. 10

### SECTION – D

8. Explain in detail mechanism of creep. Also write about impact of time and temperature on creep. 20
9. Write short notes on :
- (a) Types of ceramics 10  
(b) Formation of polymers. 10