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Roll No. : .....

**B037315(037)**

**B. Tech. (Third Semester) Examination,  
Nov.-Dec. 2021**

**(AICTE Scheme)**

**(Mechanical Engg. Branch)**

**MATERIAL SCIENCE**

***Time Allowed : Three hours***

***Maximum Marks : 100***

***Minimum Pass Marks : 35***

***Note : Attempt all questions. Part (a) is compulsory carries 4 marks. Attempt any two from (b), (c) and (d) carries 8 marks each.***

**Unit-I**

1. (a) Define crystalline and non-crystalline solids. 4
- (b) Explain any two point defects with neat sketch. 8

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- (c) Explain Edge dislocation and Screw dislocation with neat sketch. 8
- (d) Explain Tilt and Twin boundaries with neat sketch. 8

**Unit-II**

2. (a) Draw stress-strain diagrams mild steel. 4
- (b) Explain Baushinger effect with neat sketch. 8
- (c) Briefly describe cold and hot working process. 8
- (d) Difference between slip and Twining. 8

**Unit-III**

3. (a) Define solidification of metals. 4
- (b) Explain mechanism of solidifications with neat sketch. 8
- (c) Explain Hume-Rothery's rule with neat sketch. 8
- (d) Explain Homogeneous and heterogeneous nucleation with neat sketch. 8

**Unit-IV**

4. (a) Write purpose of Heat treatment process. 4

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- (b) Explain TTT curve with neat sketch. 8
- (c) Explain any three Heat treatment process. 8
- (d) Explain Vacuum and Plasma hardening process. 8

**Unit-V**

5. (a) Write properties of alloy steels. 4
- (b) Define composite materials. Write composition and properties of Gun metal. 8
- (c) Write composition and properties of High carbon steel and stainless steel. 8
- (d) Write composition and properties of Phosphor bronze, Aluminum bronze. 8