

Enrol. No. \_\_\_\_\_

**THIRD SEMESTER END TERM EXAMINATION: NOVEMBER, 2013**

**B. TECH (MAE), B. TECH (MAE) + M. TECH (A) -DD & B. TECH (MAE) + MBA**

BTM/UMA/UMC304

**MATERIAL SCIENCE & METALLURGY**  
(Only for Repeaters)

Max Marks: 70

Time: 3 Hrs

*Note: Attempt questions from all sections as directed.*

**Section - A** : Attempt any five questions out of six. Each question carries 06 marks. [30 Marks]

- Q1. Write a note on crystal imperfection.
- Q2. Discuss the manufacturing properties of material.
- Q3. Discuss the phase diagram for metals fully soluble in liquid state and partially in solid state
- Q4. Discuss i) Annealing  
ii) Normalizing
- Q5. What is intrinsic and extrinsic type of semiconductors?
- Q6. What do you mean by slip systems? Write down all possible slip systems for FCC and HCP crystal systems

**Section - B** : Attempt any two questions out of three. Each question carries 10 marks. [20 Marks]

- Q7. Explain Martensite transformation and its important characteristics.
- Q8. Draw and explain stress vs. strain curve for Ductile and brittle material? Discuss Proof Resilience and toughness with above mentioned sketch.
- Q9 Draw and explain Iron-Carbon equilibrium diagram.

**Section - C** : Compulsory question [20 Marks]

- Q10. (a) What are polymers? Distinguish between thermoplastic and thermosetting polymers in terms of their typical properties and molecular structures? (6)
- (b) What is impact loading? Explain any one of the Impact tests. (8)
- (c) Draw a eutectic phase diagram A-B from following data.
- (a) Melting point of A = 1000°C  
(b) Melting point of B = 1200°C  
(c) The system undergoes eutectic reaction at 700°C at 40% B composition.  
(d) The maximum solubility of A in B is 10% and B in A is 15% at eutectic temperature which drops down to zero at room temperature. Mark each line and phases (6)
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