

Seat No.
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**MAR\_APR 2025 SUMMER EXAMINATION****11731 Bachelor of Technology (NEP-2.0)****Sub. Name: Metallurgy****Sub. Code: 63353/73206/77737****Day and Date: MAY ,08-05-2025****Total Marks: 70****Time: 10:30 AM To 01:00 PM**

- Instructions:**
1. All questions are compulsory
  2. Draw neat labelled diagrams wherever necessary
  3. Figures to the right indicate full marks

- Q1)** Solve any two **[12]**
- a. What is Gibbs phase rule? Evaluate degree of freedom (F) for a solid solution alloy and a eutectic alloy using cooling curves **[6]**
  - b. Explain in short different imperfections in crystal structure. **[6]**
  - c. What is coring and Dendritic structure? explain with neat sketches. **[6]**
- Q2)** Solve the following **[15]**
- a. Draw Iron - Iron Carbide(Fe-Fe<sub>3</sub>C) Equilibrium diagram, along with all the reactions , phases, and temperatures. **[8]**
  - b. Classify brasses and differentiate clearly between alpha and alpha beta brass. **[7]**
- Q3)** Solve any two **[8]**
- a. Write short note on Ultra sonic Testing **[4]**
  - b. Explain the stages in dye penetrant test **[4]**
  - c. Write short note on fatigue and creep testing **[4]**
- Q4)** Solve any two **[12]**
- a. Explain the mechanism of transformation austenite into upper and lower bainite. **[6]**
  - b. Explain transformation process of austenite into martensite **[6]**
  - c. Write short note heat treatment furnaces. **[6]**

- Q5) Solve the following [15]**
- a. What is precipitation hardening? explain with neat sketch process of precipitation hardening for Al-Cu. [8]
  - b. What is nitriding? what are the different types of nitriding? explain any one [7]
- Q6) Solve any two [8]**
- a. What is sintering and what are its purposes [4]
  - b. Write short note on Self-lubricating bearing. [4]
  - c. Explain with neat sketch process of compacting in powder metallurgy . [4]

## **End Of Question Paper**

**Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -**

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (101) Bachelor of Engineering (63353) Metallurgy Part 2 SEM 3
- 2] (101) Bachelor of Engineering (77737) Metallurgy Part 2 SEM 3
- 3] (1154) B.Tech. CBCS (73206) Metallurgy Part 2 SEM 3