This question paper contains 2 printed pages.]

8450   **A**

B. Tech. (M)/I

Paper (EME–105)—METALLURGY

Time : 3 *Hours*   *Maximum Marks* : 70

(Write your Roll No. on the top immediately

on receipt of this question paper.)

Attempt any five questions.

All questions carry equal marks.

Assume any suitable data, if needed.

·1.   (a) Explain the procedure for finding crystal directions and plomes
          based on Miller's indices.   7

      (b) With suitable figures explain Bravail space lattice. Give one
           example for each space lattice.   7

2.   (a) Explain different defects of the crystal with suitable figures. 10

      (b) NaCl which has FCC structure has a density of 2.18 g/cc.
           Calculate the distance between two adjacent atoms. Atomic
           weight of Sodium = 23 and that of chlorine is 35.5.   4

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3. (a) How many atoms per mm^3 are there in (i) (1000) plome; (ii) (110) plome and (iii) plane of copper which had FCC structure which has a lattice constant $a = 3.61 \times 10^{-7}$ mm. 7

   (b) Prove that Atomic packing factor for FCC and HCP crystal is equal. 7

4. (a) Explain twinning and slip with suitable sketches. 7

   (b) Write a detailed note on recovery, recrystallisation and grain growth. 7

5. (a) With a diagrammatic representation explain the difference between Brittle fracture and Ductile fracture. 7

   (b) Explain the creep curve for metals. 7

6. (a) Explain the Binary eutectic diagram for Copper-Nickel system. 7

   (b) Draw TTT diagram and explain various Transformations. 7

7. (a) Draw Iron cementite diagram. Explain its utility in Industry. 7

   (b) Explain the difference between Annealing and Normalising. 7

8. (a) Explain the composition and properties of stainless steels. 7

   (b) Briefly explain corrosion and preventive measures of corrosion. 7