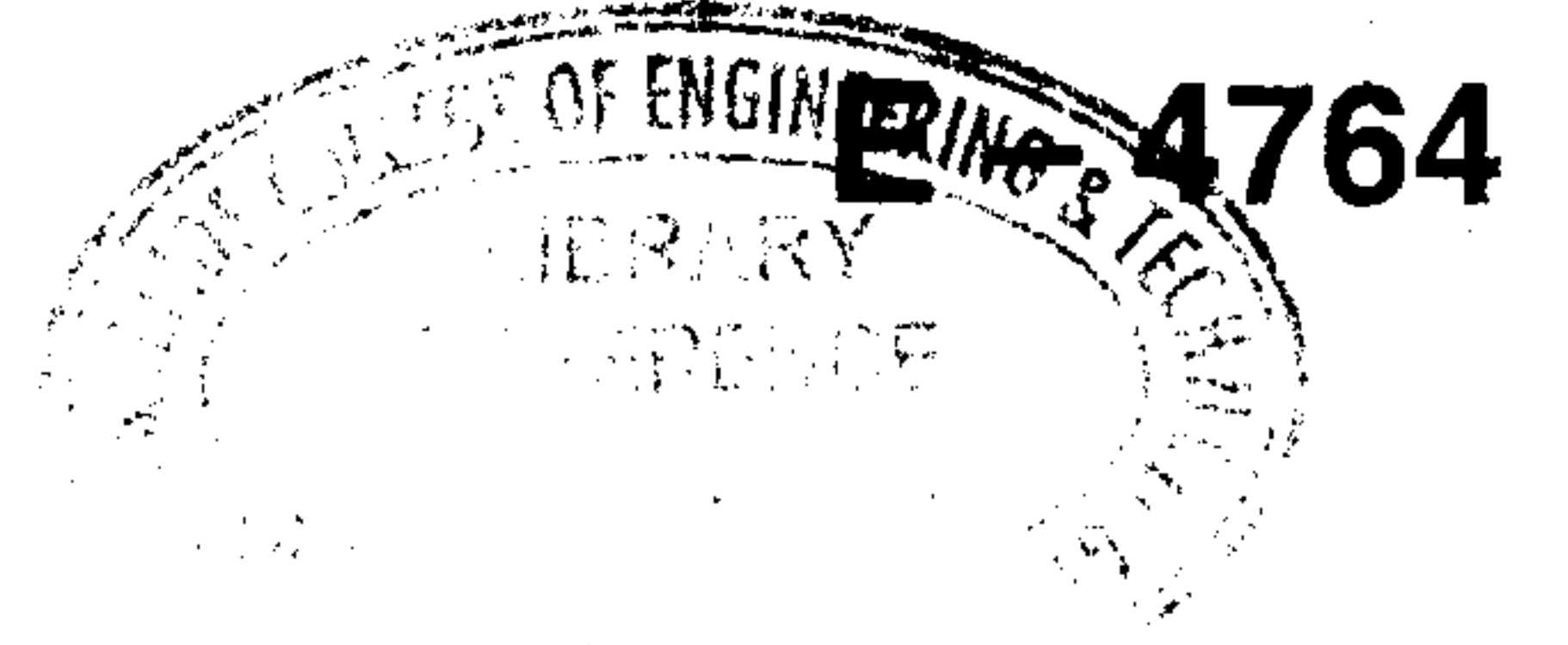




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Reg. No. :

Name :

**Fourth Semester B.Tech. Degree Examination, September 2018
(2008 Scheme)**

08.403 : METALLURGY AND MATERIAL SCIENCE (MP)

Time : 3 Hours

Max. Marks : 100

PART - A

Answer **all** questions. **Each** question carries **4** marks.

1. What is the importance of material properties on selection of engineering materials for an application ?
2. Write short notes on major atomic bonds found in materials.
3. What do you mean by space lattice, unit cells, co-ordination number and atomic packing factor ?
4. What are slip and climb ? What is its importance ?
5. What is diffusion ? Explain Fick's laws of diffusion.
6. Write short notes on PVD and Thermal spraying.
7. Explain the terms Recovery, Recrystallisation and Grain growth.
8. Explain Griffith's crack theory.
9. Differentiate Creep and Fatigue.
10. Write short notes on Ceramics and Smart materials. **(10×4=40 Marks)**

P.T.O.



PART – B

Answer **any one** question from **each** Module. **Each** question carries **20** marks.

Module – 1

11. What are crystal imperfections ? Explain.
12. What are Miller indices ? Explain the steps to find out Miller plane and Miller direction in a unit cell. Show the followings in different unit cells (123), (321), [123], [321] and [111].

Module – 2

13. What is solubility limit in solid solutions ? What are the factors that affecting solid solution formations ? Explain the different types of solid solutions.
14. What are phase diagrams ? Explain isomorphous phase diagram for a binary system with suitable example. Explain the conditions and different curves in the diagram.

Module – 3

15. Explain the terms stress, strain, ductility and brittleness. Draw stress-strain curves for ductile and brittle material with suitable examples. Explain the various salient features of the curves and their practical importance.
16. Differentiate pure material and alloy. What is alloying ? What is its importance ? Explain five important alloying elements used with iron with their functions in the alloy and the field of applications of these alloys.

(3×20=60 Marks)
