

D 20616-A

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Name.....

Reg. No.....

**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, OCTOBER 2011**

AN/AM/ME 09 306—METALLURGY AND MATERIAL SCIENCE

(2009 admissions)

Time : Three Hours

Maximum : 70 Marks

Part A

*Answer all questions.
Each question carries 2 marks.*

1. What is the APF for FCC and HCP ?
2. What are the two types of line defects ?
3. Define fatigue.
4. Draw cooling curve of pure metal.
5. What is meant by duplex steels ?

(5 × 2 = 10 marks)

Part B

*Answer any four questions.
Each question carries 5 marks.*

6. Explain covalent and hydrogen bonding.
7. Differentiate between slip and twin.
8. List the factors which affects recrystallisation temperature.
9. Draw Pb-Sn phase diagram.
10. Explain austempering.
11. Write nominal composition of ferritic stainless steels. Explain its properties and applications.

(4 × 5 = 20 marks)

Part C

*Answer section (a) or section (b) of each question.
Each question carries 10 marks.*

12. (a) Explain specimen preparation techniques for TEM.

Or

- (b) Draw the following planes in a cubic crystal :—

(100) (111) (110) (123) (234).

Turn over

13. (a) Write short notes on crystal defects.

Or

(b) Explain the solid solution strengthening. How distribution affect/strengthen the solid solution alloys.

14. (a) Explain hardening of low carbon and medium carbon steels with reference to their TTT diagrams.

Or

(b) State lever rule. Explain with an example.

15. (a) Write short note on Gray cast-iron, SG iron, malleable iron and white iron.

Or

(b) Write briefly about properties and applications of any *two* aluminium alloys.

(4 × 10 = 40 marks)

