Code No. : 5335/N

FACULTY OF ENGINEERING
B.E. 2/4 (Mech./Prod. AE) I Semester (New) (Main) Examination, Dec. 2011
METALLURGY AND MATERIAL SCIENCE

Time: 3 Hours] [Max. Marks: 75

Note : *Answer **all** questions from Part **A**. Answer **any five** questions from Part **B**.*

PART – A **(2.5×10=25 Marks)**

1. Explain types of Fracture.
2. What is Bauschinger effect ?
3. Draw neat sketch of S – N curve for mild steel.
4. Draw neat sketch of creep curve.
5. Define a phase.
6. Define cementite.
7. Explain Normalising.
8. Explain pack carburising.
9. Draw neat sketch of Electric Arc Furnace.
10. What is the effect of chromium on an alloying element on steels.

PART – B **(5×10=50 Marks)**

11. a) Explain Griffith theory of Brittle fracture. **5**
    b) Differentiate between Ductile and Brittle fracture with neat sketches. **5**
12. a) Explain cumulative Fatigue theory. **3**
    b) Factors to be considered for the improvement of the fatigue life. **3**
    c) Draw a sketch of fatigue fractured specimen. **4**
13. How to construct a phase diagram for an isomorphous system. Explain lever rule assuming suitable compositions. **10**
14. Draw T T T curves for Eutestoid steel and superimose continuous cooling curves. Explain CCR. **10**
15. Explain LD process of steel making with neat sketch and reactions. **10**
16. Explain at least four cast Irons with microstructures, properties, compositions, and applications. **10**
17. Write short notes on : **10**
    i) Cold working and hot working **3**
    ii) Explain both laws of diffusion **3**
    iii) Explain the effect silicon, Nickel and chromium on steels. **4**
