AU/IP/ME-401(N)

B. E. (Fourth Semester) EXAMINATION, June, 2011

(Common for AU, IP & ME Engg. Branch)

MATERIAL SCIENCE AND METALLURGY

Time : Three Hours Maximum Marks : 100 Minimum Pass Marks : 35

Note : Attempt any *five* questions. All questions cany equal marks. Assume missing data suitably.

1.What are different methods for producing iron in the industry ? Explain any *one* in detail. 20

Or

2. (a) Explain van der Waals, ionic and covalent bonds. 10

(b) What properties should be considered while selecting acid, basic and natural refractory ? 10

3. Explain the following mechanical properties : 20

(i) Ductility

(ii) Brittleness

(iii) Hardness

(iv) Toughness

(v) Stiffness

(vi) Malleability

(vii) Resilience

(viii) Strength

(ix) Fatigue

(x) Creep

Or

4. (a) Explain fracture mechanism of mild steel in tensile loading. 10

(b) Differentiate between point and line defects in a crystal. 10

5. (a) Explain the following : 15

(i) Eutectic system

(ii) Peritectic system

(iii) Eutectoid system

(b) How does alloy formation take place ? 5

Or

b. Draw Iron-Carbon equilibrium diagram. Explain in detail.

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7. What do you mean by TIT diagrams ? What is the effect of cooling rate and cooling medium on properties obtained after heat treatment ? Explain with diagrams. 20

Or

8. Explain the following : 20

(i) Normalizing

(ii) Annealing

(iii) Spheroldizing

(iv) Hardening

9.(a) What are different applications of powder metallurgy' ? 10

(b) With composition write down advantages and applications of mild steel. 10

Or

10. Differentiate between plastics, composites and ceramics, Classify plastics. What are different properties of plastics ?

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