Code No. 6020 / S

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/AE) I- Semester (Suppl.) Examination, July 2014

Subject : Metallurgy and Material Science

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1 What is the difference between a unit cell and a single crystal?
2 Explain the difference between recovery and recrystallization.
3 Explain orange peel effect.
4 What are the different modes of fracture?
5 Explain peritectoid reaction in steels.
6 Eutectoid reaction in steels.
7 Nitriding
8 Methods of production of copper
9 State the characteristics of brass metal.
10 Duraluminium applications

PART – B (50 Marks)

11 (a) Define jog. Explain the effect of jog on yield strength of a material.
(b) Derive Griffith equation for brittle material of thick plates.

12 (a) How does the SN curve of carbon steel differ from that of a high strength aluminum alloy? Explain.
(b) Define Fick's law of diffusion. Explain various factors affecting diffusion.

13 (a) Classify Plain carbon steels. Explain the effect of carbon on the properties of plain carbon steels.
(b) Explain construction of phase diagram of lead (Pb) and Tin (Sn) system with neat diagram.

14 (a) Explain austenite-bainite transformation of hypo-eutectoid steel with help of TTT curves.
(b) Discuss various types of case of hardening processes.

15 Make a neat sketch of a cupola, indicating is various zones and describe the following:
(i) Construction (ii) Preparation before operations, (iii) Charging method
(iv) Different zones and their functions, (v) Operation and (vi) Application

16 (a) Explain the relation between work-hardening and Slip with suitable example.
(b) Explain the composition, properties and applications of Ti-6Al-4V alloy?

17 Write a short notes any **two** of the following:
(a) Normalizing (b) Maraging Steels (c) Ductile Fracture

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