Roll No _____ **Examination May-2014** Total no of page-2

B.Tech.

ME-205 Engineering Materials & Metallurgy

Paper ID- A0860

Time allowed: 3 hours Max. Marks: 60

Note: The question paper has three sections. Section A is compulsory. Attempt any four questions from Section B and any two questions from Section C.

Section A

Que. 1 (a) What is crystal structure?

(b) What is a Face-centred cubic structure?

(c) What is critical resolved shear stress for slip?

(d) What are Hume- Rothery's rules?

(e) Give Peritectic and Peritectoid reactions.

(f) List some physical properties of engineering materials.

(g) What is the purpose of heat treatment?

(h) What is process annealing?

(i) What are the advantages of induction hardening?

(j) What is sub-zero treatment of steel? (10x2=20)

Section B

Que. 2 Define atomic radius and atomic packing factor and calculate their values for BCC crystal. (5)

Que. 3 Explain the yield point phenomenon in materials in terms of dislocation. (5)

Que. 4 What is preferred orientation? Give its engineering applications. (5)

Que. 5 Describe an equilibrium diagram of an alloy with a peritectic transformation whose components have complete mutual solubility in the liquid state and limited solubility in the solid state. (5)

Que. 6 Discuss principle and applications of tempering process. (5)

Section C

Que. 7 Describe in detail time-temperature-transformation curves. (10)

Que. 8 Draw and explain an Iron Carbon equilibrium diagram. (10)

Que.9 (a) What is meant by surface hardening? Describe flame hardening process. (5)

(b)Describe various types of defects in heat treatment and their remedies. (5)

End