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Roll No

AU/IP/IEM/PR/ME - 402**B.E. IV Semester**

Examination, December 2015

Material Science And Metallurgy**Time : Three Hours****Maximum Marks : 70**

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each questions are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Define crystal structures. www.rgpvonline.in
- b) Define covalent bonding in atoms with example.
- c) Draw crystal structure for simple cubic, BCC, FCC and HCP structures.
- d) Explain casting method used manufacturing of metal components.

OR

Explain types and applications of ceramic materials.

2. a) Define vacancy point defects in atomic structure.
- b) Define Frenkel defects in crystal structure.
- c) What do you understand by dislocations? How they are measured?
- d) Explain screw dislocations with neat diagram.

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OR

Draw Stress-Strain diagram for a ductile material and explain its important features.

3. a) Write Gibbs phase rule used for phase diagrams.
- b) How phase diagram can be classified?
- c) What information can be gathered from a phase diagram?
- d) Draw and explain phase diagram for an Isomorphous binary system.

OR

Draw and explain iron carbon equilibrium diagram.

4. a) What is the purpose of thermal processing of metal?
- b) What are various factors considered in heat treatment of components?
- c) Write Induction hardening and flame hardening in short.
- d) Draw and explain TTT diagram for eutectoid steel.

OR

Explain various types of annealing processes. www.rgpvonline.in

5. a) Define fatigue failure. In which components it is occurred.
- b) What are Three basic requisites for occurrence of a fatigue fracture?
- c) What is the classification of plastics?
- d) Draw and explain typical creep curve

OR

What are composite materials? What are their constituents and how they are classified?

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