

Roll No

AU/IP/IEM/PR/ME-402

B.E. IV Semester

Examination, December 2016

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) What is the use of Aston process?
b) What is the use of L.D. Process?
c) What is the Composition of Pig iron?
d) Name the four types of bonds observed in material.
Describe any two of them giving examples.

OR

Explain briefly the BCC and HCP structures.

2. a) Differentiate between the plastic deformation and fracture.
b) What do you understand by the Term grain growth?
c) Write short note on Bauschinger effect.
d) What are the metallurgical advantages of hot working process over cold working process?

OR

What are the Point, line and surface imperfection found in solid crystals? Illustrate these imperfections with suitable sketches.

3. a) Define the term Alloy.
b) What do you mean by Allotropy of metals?
c) Explain in brief the Hume-Rothery's rule.
d) What is Equilibrium diagram? State its importance and objectives.

OR

Explain in brief the iron-carbon diagram.

4. a) State the objective of annealing.
b) What is Full annealing?
c) Describe the critical rate of quenching.
d) Explain in brief the various hardening methods.

OR

State the effect of tempering temperature on the mechanical properties of steel.

5. a) What is Fatigue?
b) What is Creep?
c) Explain the meaning of term elastomer.
d) Explain in brief the various types of plastics.

OR

State the advantages and disadvantages of powder metallurgy.
