

**11012 : Material Technology : 4 CT 04**

P. Pages : 2

Time : Three Hours

**AW - 3080**

Max. Marks : 80

- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Diagrams and chemical equations should be given wherever necessary.
  4. Illustrate your answer necessary with the help of neat sketches.
  5. Use of cell phone is not allowed.
  6. Use of pen Blue/Black ink/refill only for writing the answer book

**SECTION – A**

1. a) Explain the difference between Crystalline and non crystalline structure of metals? 7  
b) Define Co – ordinate number and explain the difference between BCC and FCC structure. 7

**OR**

2. a) What are structure sensitive and structure insensitive properties? Explain with suitable example. 7  
b) What do you mean by imperfection in crystal? Explain one dimensional defect. 7
3. a) Explain in details the grain growth in crystals. 7  
b) Explain in details recrystallization of metals and its effect on metal structure. 6

**OR**

4. a) How mechanical properties change with changes in temperature? Explain with suitable example. 7  
b) What do you mean by metal failure under service conditions? Explain with suitable example. 6
5. a) Differentiate between white cast iron and grey cast iron and the phase diagram for metals. 7  
b) How will you prepare iron carbon diagram? Explain in details. 6

**OR**

6. a) How solidification of pure metals occur and discuss the phenomena of nucleation and grain growth in metals. 7  
b) Discuss in details the intersolubility of two different metals in liquid and solid state with some suitable example. 6

## SECTION - B

7. a) What are the advantages of heat treatment of metals and why is it necessary? 7  
b) What is annealing and how is it performed? Explain the salient features. 6

OR

8. a) What are the various heat treatment techniques and explain the meaning of case hardening. 7  
b) How is nitriding and surface hardening is achieved? 6
9. a) What are refractories? Explain their important properties and applications. 7  
b) How are elastomers produced? Explain their applications. 6

OR

10. a) What are thermosetting materials? Explain their applications. 7  
b) What are ceramics? State and explain their important properties and applications. 6
11. a) Explain the corrosion mechanism and theories of corrosion. 7  
b) What are non destructive methods of testing? Explain in details. 6

OR

12. a) Explain the role of protective coatings in prevention of corrosion. 7  
b) What are the various forms of corrosion? Explain in details. 6

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