



C16-M-401

6446

BOARD DIPLOMA EXAMINATION, (C-16)  
AUGUST/SEPTEMBER—2021  
DME - FOURTH SEMESTER EXAMINATION  
ENGINEERING MATERIALS

Time : 3 hours ]

[ Total Marks : 80

**PART—A**

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Write any three differences between destructive and non-destructive tests. 1×3=3
2. Define the following terms : 1½+1½=3
  - (a) Space lattice
  - (b) Unit cell
3. List out the various raw materials required for production of iron. 1×3=3
4. Define the following terms : 1½+1½=3
  - (a) Pearlite
  - (b) Ferrite
5. Define substitutional solid solution and interstitial solid solution. 1½+1½=3

6. Define heat treatment. What are the stages in heat treatment? 1+2=3
7. What is the purpose of annealing in heat treatment? 3
8. State the properties of magnesium alloy. 3
9. Write a short note on babbitt metal. 3
10. What are the advantages of powder metallurgy? 3

### PART—B

**Instructions :** (1) Answer *any five* questions.  
 (2) Each question carries **ten** marks.  
 (3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. (a) Define the terms ductility and malleability.  $2\frac{1}{2}+2\frac{1}{2}=5$   
 (b) State the properties and uses of aluminium alloy.  $2\frac{1}{2}+2\frac{1}{2}=5$
12. Explain the Rockwell hardness test and compare B-scale with C-scale.  $5+5=10$
13. Determine the effective number of atoms in the following structures with neat sketches :  $5+5=10$   
 (a) Face centered cubic  
 (b) Body centered cubic
14. Draw a neat sketch of puddling furnace and explain its working.  $5+5=10$
15. Sketch the iron-carbon equilibrium diagram and mark the salient points. 10

- 16.** Name the important heat treatment process of steel. Explain any two of them with neat sketches. 2+4+4=10
- 17.** Write the composition, properties and applications of (a) grey cast iron and (b) white cast iron. 5+5=10
- 18.** Explain the isostatic moulding and extruding process. 5+5=10

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