



C16-M-401

6446

BOARD DIPLOMA EXAMINATION, (C-16)  
OCTOBER—2020  
DME—FOURTH SEMESTER EXAMINATION  
ENGINEERING MATERIALS

Time : 3 hours ]

[ Total Marks : 80

**PART—A**

3×10=30

**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. Define the following terms :
  - (a) Percentage of elongation
  - (b) Percentage of reduction in area
2. Sketch neatly the crystal structure of F.C.C. Give the three examples of F.C.C. structure.
3. State the advantages of steel making in electric furnace.
4. Define the following terms :
  - (a) Phase
  - (b) Solid solution
5. What is steel? Distinguish hypo eutectoid steel from hyper eutectoid steel.

- \* 6. State the importance of tempering and classify tempering processes.
7. List out any six methods of heat treatment of steel.
8. Write short notes on the following :
- (a) Brass
- (b) Bronze
9. What is alloy steel? What are the desirable properties in tool steel?
10. State three advantages and disadvantages of powder metallurgy.

**PART—B**

10×5=50

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

11. (a) Explain the terms creep and fatigue.  
(b) Write short notes on (i) Muntzmetal (ii) Monel metal.
12. Explain ultrasonic testing with a neat sketch.
13. (a) Define the term recrystallization.  
(b) Describe the solidification of pure metal with a neat sketch.
14. Explain the process of steel making in open hearth furnace. Draw the neat sketch of a furnace and label the parts.
15. Sketch iron-carbon equilibrium diagram and mark the salient points.
16. Name the important heat treatment processes of steel. Explain any two of them with neat sketches.

\* **17.** Write short notes on the following :

- (a) Stainless steel
- (b) High speed steel
- (c) Gray cast iron

**18.** Explain the following processes :

- (a) Rolling
- (b) Explosive compacting
- (c) Slip casting

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