



C09-M-404

3504

BOARD DIPLOMA EXAMINATION, (C-09)
MARCH/APRIL—2018
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. State the principal of ultrasonic test. 3
2. What is dendrite? How are they formed? 3
3. Draw a neat sketch of electric arc furnace indicating the parts. 3
4. Define the following structures : 1½+1½
 - (a) Ferrite
 - (b) Ledeburite
5. What is lever rule? 3
6. What is vacuum hardening? 3
7. State any three purposes of heat treatment process. 3
8. What is the effect of carbon on mechanical properties on steel? 3

9. Write the properties of grey cast iron. 3
10. What is green strength of a metal powder? 3

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Write short notes on the following tests : 5+5
- (a) X-ray test
- (b) Magnetic detection test
12. Determine the effective number of atoms in the following structures with a neat sketch : 3+3+4
- (a) Face-centered cubic
- (b) Body-centered cubic
- (c) Hexagonal close packed
13. With a neat sketch, explain the process of steel making using LD process. 10
14. Sketch iron-carbon equilibrium diagram and write all the reactions with reference to this diagram. 10
15. Explain the following heat treatment processes : 5+5
- (a) Full annealing
- (b) Normalising
16. Write the composition and properties of the following : 3+3+4
- (a) Monel metal
- (b) Constantan
- (c) Phosphor bronze

- 17.** Explain any three methods of preparing metal powders with neat sketch. 4+3+3
- 18. (a)** What are the properties of—
- (i) zinc;
 - (ii) tin? 2½+2½
- (b)** Define the following mechanical properties : 2½+2½
- (i) Toughness
 - (ii) Compressive strength
