



C14-M-302

4250

**BOARD DIPLOMA EXAMINATION, (C-14)  
SEPTEMBER/OCTOBER - 2020  
DME—THIRD SEMESTER EXAMINATION**

MATERIAL SCIENCE

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. Draw stress-strain diagram for ductile material and indicate the salient point on it.
2. Define space lattice and unit cell.
3. List various raw materials required for production of iron.
4. What is steel? Distinguish between hypoeutectoid and hypereutectoid steels.
5. Define phase and solid solution.
6. Define heat treatment. List any six methods of heat treatment.
7. What is meant by case hardening? What are various case hardening processes?
8. Give the composition and use of gray cast iron.

- \* 9. Name three types of aluminum alloys. Give example for each.
10. Define hot pressing.

**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. What are the advantages of non-destructive testing methods? Explain the radiography test.

12. (a) Define the term recrystallization.

(b) Describe the solidification of pure metal with a neat sketch.

13. Explain the refining of cast iron in cupola furnace with neat sketch.

14. Draw and describe cooling curve for pure metal.

15. Explain briefly the tempering of steel. Distinguish between austempering and martempering.

16. Discuss the influence of the following elements on the properties of cast iron :

(a) Silicon

(b) Manganese

(c) Sulphur

(d) Nickel

\* 17. (a) What are alloy steel and advantages of alloy steel?

(b) Explain the terms impact strength and toughness.

18. Describe briefly various methods of producing metal powders.

\*\*\*