

7257

BOARD DIPLOMA EXAMINATION, (C-20)

MAY—2023

DME - THIRD 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. How are the engineering materials classified?
2. List out the three types of reinforcement materials.
3. Write short notes on X-ray testing of metals.
4. List out any three types of space lattice and mention effective number of atoms.
5. List out the raw materials of blast furnace and mention their functions.
6. Draw the cooling curve of pure iron.
7. Differentiate between annealing and normalizing.
8. State the purpose of heat treatment of steels.
9. List out any three ferrous metals and mention their applications.
10. Write one use each of lead, tin and zinc.

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PART—B

8×5=40

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

11. Describe the following destructive tests :

- (a) Compressive strength test
- (b) Impact strength test

(OR)

Write short notes on the following mechanical properties :

- (a) Hardness
- (b) Brittleness
- (c) Fatigue
- (d) Creep resistance

12. Describe the factors promoting grain size and its effect on mechanical properties.

(OR)

Describe the structure of the following with neat sketches :

- (a) FCC
- (b) BCC

13. Explain the process of manufacturing wrought iron using puddling furnace with a neat sketch.

(OR)

Explain the process of manufacturing steel on Bessemer process with a neat sketch.

14. Locate eutectic, eutectoid and peritectic points on the iron carbon equilibrium diagram.

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(OR)

Explain the following heat treatment processes :

(a) Hardening

(b) Case hardening

- 15.** List out any four alloy steels used in product design and state their compositions and applications.

(OR)

Write the classification of carbon steels and state their compositions and applications.

PART—C

10×1=10

- Instructions :** (1) Answer the following question.
(2) The question carries **ten** marks.
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 16.** (a) State the phase rule and explain its significance in the study of iron-carbon system.

(b) Distinguish between acid and basic processing of steel making.

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