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C09-M-404

**3504**

**BOARD DIPLOMA EXAMINATION, (C-09)**

**MARCH/APRIL—2021**

**DME - FOURTH SEMESTER EXAMINATION**

**ENGINEERING MATERIALS**

*Time : 3 hours ]*

*[ Total Marks : 80*

**PART—A**

4×5=20

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

1. List out any three types of non-destructive tests conducted on the materials.
2. List out three common types of crystalline structures.
3. Name any three important ores of iron.
4. What is hypo-eutectoid steel?
5. List allotropic forms of pure iron.
6. What are various case hardening processes?
7. Define heat treatment of steel.
8. List any three ferrous metals and their alloys.
9. State the use of bearing materials.
10. List out any three methods of compacting of metal powders.

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## PART—B

15×4=60

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

11. Explain with neat sketches (a) X-ray test and (b) Radiography test.
12. What are the factors promoting grain size? What is the effect of grain size on mechanical properties?
13. Describe the method of producing cast iron in cupola furnace with a neat sketch.
14. Sketch the iron-carbon equilibrium diagram indicating all salient points.
15. List and explain any one type of heat treatment processes with applications.
16. Write the properties and applications of the following :
  - (a) Invar
  - (b) Constantan
  - (c) Phosphor bronze
17. (a) Write the properties and applications of the following :
  - (i) Brass
  - (ii) Lead(b) Define the following mechanical properties :
  - (i) Malleability
  - (ii) Elasticity
18. Explain any three methods of preparing metal powders with neat sketches.

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