4250

C14–M–302

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BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2018
DME—THIRD SEMESTER EXAMINATION

MATERIALS 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. Distinguish between destructive and nondestructive tests.

2. Define the following :

(a) Unit cell

(b) Space lattice.

3. What are the main raw materials used for production of iron?

4. State Gibbs, phase rule and abbreviate the terms involed in it.

5. Define solid solution.

6. List the purposes of heat treatment for steels.

7. Define the following :

(a) Martensite

(b) Binate

8. State the composition and use of Babbitt metal.

9. State are the difference between grey cast iron and white cast iron.

10. What are the advantages of power metallurgy?

PART–B

10×5=50

Instructions : (1) Answer *any* **five** questions.
(2) Each questions 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) Define the following :

(i) Fatigue

(ii) Creep

(iii) Toughness

(iv) Hardness

(v) Ductility

(b) Write down the composition, properties and engineering applications of brass.

12. Explain Brinell hardness test and give its limitations and applications.

13. How are space lattices mainly classified? Explain any two with neat sketch.

14. Draw a neat sketch and explain how cast iron is manufactured in a cupola furnace.

15. Sketch the iron carbon equilibrium diagram and show the salient points, phase and critical points.

16. Explain the following heat treatment process :

(a) Subzero treatment

(b) Vaccum hardenning

17. State the composition, properties and uses of the following :

(a) High speed steel

(b) Stainless steel

18. Explain extruding and isostatic moulding.

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