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C09–M–404

3504

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2015

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 principle of ultrasonic test.

2. Distinguish between Crystalline and Amorphous solids.

3. What are the various types of iron ores?

4. Write the Peritectic Reaction in Iron Carbon Diagram.

5. State the properties of following structures :

(a) Ferrite

(b) Pearlite

6. Define heat treatment. What are stages in heat treatment?

7. Distinguish between Hardening and Tempering.

8. What are the effects of combined carbon and free carbon on the properties of cast iron?

9. Write a short note on inconel.

10. List the sequence of operations involved in powder metallurgy.

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. Explain Brinell hardness test. State its advantages, limitations and applications.

12. What are the factors promoting the grain size? What is the effect of grain size on mechanical properties?

13. *(a)* Describe electric arc furnace with a neat sketch.

(b) Distinguish between acidic and basic open hearth process.

14. *(a)* Draw and describe cooling curve for pure metal.

(b) Define solid solution. Distinguish between substitutional and interstitial solid solution.

15. Explain the following processes with neat sketches :

(a) Flame hardening

(b) Induction hardening

Also mention their advantages and disadvantages.

16. State the composition, properties and applications of the following :

(a) Nickel steel

(b) 18/8 stainless steel

(c) HSS

17. Explain the following processes :

(a) Rolling

(b) Explosive compacting

(c) Slip casting

18. *(a)* Write the applications of following engineering materials :

(i) Lead

(ii) Zinc

(b) List out various types of brasses and describe the composition, properties and applications of any two.

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