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C16–M–304

# 5490

## BOARD DIPLOMA EXAMINATION, (C–16)

## MARCH/APRIL—2018

## DME—THIRD SEMESTER EXAMINATION

ENGINEERING MATERIAL

*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.** Differentiate between destructive testing and non-destructive testing.

**2.** Draw the space lattice of the following :

*(a)* BCC

*(b)* FCC

*(c)* HCP

**3.** List different types of iron ore.

**4.** State Gibb's phase rule and abbreviate the terms involved in it.

**5.** Define *(a)* ferrite and *(b)* pearlite.

6. Differentiate between annealing and normalizing.

7. What do you mean by case hardening? List various case hardening processes.

8. Write the composition and properties of gray cast iron.

9. Write the properties and applications of aluminium.

10. Write the advantages and limitations of 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 ultrasonic test with neat sketch. Write its advantages and limitations.

12. *(a)* Define the terms 'space lattice' and 'unit cell'. 3

*(b)* Explain the solidification of pure metals with neat sketch. 7

13. *(a)* Explain the LD process with neat sketch. 7

*(b)* Differentiate between Bessemer convert and LD process. 3

14. Sketch iron-carbon equilibrium diagram and mark the salient points.

**15.** *(a)* Explain hardening heat treatment process. 5

*(b)* Explain tempering heat treatment process. 5

**16.** *(a)* State the effect of carbon as properties of steel. 5

*(b)* State the effect of following ingredients on properties of steel. 5

**17.** *(a)* Write the properties and applications of zinc. 5

*(b)* Define ductility, malleability, hardness, brittleness and creep resistance. 5

**18.** Explain *(a)* extruding and *(b)* gravity sintering.

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