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C16-M–401

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BOARD DIPLOMA EXAMINATION, (C-16)

AUGUST/SEPTEMBER—2021

DME - FOURTH SEMESTER EXAMINATION

ENGINEERING MATERIALS

Time : 3 hours] [*Total Marks* : 80

PART—A

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. Write any three differences between destructive and non-destructive tests. 1×3=3

2. Define the following terms : 1½+1½=3

(a) Space lattice

(b) Unit cell

3. List out the various raw materials required for production of iron. 1×3=3

4. Define the following terms : 1½+1½=3

(a) Pearlite

(b) Ferrite

5. Define substitutional solid solution and interstitial solid solution. 1½+1½=3

6. Define heat treatment. What are the stages in heat treatment? 1+2=3

7. What is the purpose of annealing in heat treatment? 3

8. State the properties of magnesium alloy. 3

9. Write a short note on babbitt metal. 3

10. What are the advantages of powder metallurgy? 3

PART—B

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* Define the terms ductility and malleability. 2½+2½=5

(b) State the properties and uses of aluminium alloy. 2½+2½=5

12. Explain the Rockwell hardness test and compare B-scale with C-scale. 5+5=10

13. Determine the effective number of atoms in the following structures with neat sketchs : 5+5=10

(a) Face centered cubic

(b) Body centered cubic

14. Draw a neat sketch of puddling furnace and explain its working. 5+5=10

15. Sketch the iron-carbon equilibrium diagram and mark the salient points. 10

16. Name the important heat treatment process of steel. Explain any two of them with neat sketches. 2+4+4=10

17. Write the composition, properties and applications of *(a)* grey cast iron and *(b)* white cast iron. 5+5=10

18. Explain the isostatic moulding and extruding process. 5+5=10

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