

**6446****BOARD DIPLOMA EXAMINATION, (C-16)****MARCH / APRIL — 2021****DME — FOURTH SEMESTER EXAMINATION****ENGINEERING MATERIALS***Time* : Three Hours][*Maximum Marks* : 80**PART-A**

3×10=30

**Instructions :** (i) Answer **all** questions.  
(ii) Each question carries **three** marks.  
(iii) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Distinguish between Destructive and Non-destructive tests.
2. Define Space lattice and a Unit cell.
3. What are the main raw materials used for production of iron ?
4. Calculate the percentage of Cementite and Pearlite in 1.2% carbon steel.
5. What is Thermal equilibrium diagram ?
6. List out any six methods of heat treatment of steel.
7. Differentiate between Annealing and Normalizing.
8. List out the different types of cast iron.
9. Write the composition, properties and uses of Duralumin.
10. State the different methods of producing metal powders.

- \***Instructions :** (i) Answer any **five** questions.  
(ii) Each question carries **ten** marks.  
(iii) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Explain Ultrasonic testing with a neat sketch. 5+5
12. What are the factors promoting the grain size ? What is the effect of grain size on mechanical properties ? 5+5
13. Describe the L-D converter with a neat sketch. 5+5
14. (a) Explain cooling curve of pure iron. 4  
(b) Distinguish between Hypoeutectoid, eutectoid, Hypereutectoid steels. 2+2+1
15. Explain the following processes : 4+3+3  
(a) Carburising  
(b) Nitriding  
(c) Sub-zero treatment
16. State the influence of the following elements on plain carbon steels : 2.5×4  
(a) Silicon  
(b) Manganese  
(c) Phosphorus  
(d) Sulphur
17. (a) Define the following properties : 2+2  
(i) Toughness  
(ii) Impact strength  
(b) State the properties and uses of  
(i) copper  
(ii) zinc  
(iii) lead. 2+2+2

18. Explain the following processes :

4+3+3

- \* (a) Rolling
- (b) Explosive compacting
- (c) Slip casting

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