C16-MET-404

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BOARD DIPLOMA EXAMINATION, (C-16)
OCTOBER—2020
DMET—FOURTH SEMESTER EXAMINATION

HEAT TREATMENT TECHNOLOGY

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. Define heat treatment and write its purpose.

2. Define the terms (a) pearlite, (b) bainite.

3. Differentiate between hardness and hardenability.

4. Define grain size. Write its effects on properties of steel.

5. Define alloy. Write the purpose of alloying.

6. Define secondary hardening.

7. Define case hardening. List out any two case hardening techniques.

8. Define (a) carburizing, (b) nitriding.

9. List out any three Al-alloys that respond to precipitation hardening.

10. Define controlled atmosphere. Write the necessity of maintaining it.

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1

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

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

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

11. Explain the construction of Time Temperature Transformation (TTT) diagrams with a neat sketch and list out the factors affecting position of TTT curve.   7+3

12. Explain the Jominey end-quency test and state the use of this test.   8+2

13. Explain the grain size determination by carburizing method with neat diagrams.   10

14. Give the compositions, properties and applications of—

(a) nickel steels;

(b) chromium steels;

(c) manganese steels.   3+3+4

15. Mention the causes and remedies of the following heat treatment defects :   2½×4=10

(a) Low hardness

(b) Soft spots

(c) Oxidation

(d) Decarburization

16. Explain (a) pack carburising, (b) liquid carburising.   5+5

17. Explain solution treatment with the help of Al-Cu phase diagram.   10

18. Explain the working principle of the following furnaces with a neat sketch :   5+5

(a) Muffle furnace

(b) Salt bath

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