APRIL / MAY - 2012

D.MET. - IV SEMESTER EXAMINATION

HEAT TREATMENT TECHNOLOGY

Time : 3 Hours] [Total Marks : 80

PART - A 10×3 = 30

Instruction : *Answer all questions and each question carries three marks.*

1 Define Normalizing. List out the main objectives of normalizing. $1\frac{1}{2}+1\frac{1}{2}$

2 What is retained austenite ? List the factors That increase the amount of retained austenite ? $1\frac{1}{2}+1\frac{1}{2}$

3 Classify alloying elements based carbide forming tendency with examples. 3

4 List the composition and properties of Chromium steeis. $1\frac{1}{2}+1\frac{1}{2}$

5 State the chemical composition of cemented carbides. 3

6 State the effect of nitriding on properties of steels. 3

7 List out any six possible defects in heat treated products.

8 Define case hardening. Classify case hardening techniques. $1\frac{1}{2}+1\frac{1}{2}$

9 State the necessity of maintaining controlling atmospheres in a heat treatment furnace. 3

10 State the heat treatment process for Brasses. 3

PART - B 5×10 = 50

Instruction : *Answer any five questions. Each question carries ten marks.*

11 (a) Explain the procedure of tempering of steel. 6+4
(b) State the effect of tempering on structural changes and mechanical properties of steel.

12 Explain the mechanism of austenite to martensitic transformation 10

13 Explain Jominey end quench test method for measuring hardenability of steel. 10

14 (a) Explain the determination of grain size of austenite by ASTM comparison method.. 4+6
(b) Explain the method to determine austenite grain size by Heyn"s Intercept method.

15 (a) Describe the heat treatment process for Ferritic stainless steels. 5+5
(b) State the composition, properties and applications of Maraging steels.

16 (a) Explain the process of Aus-tempering with a neat sketch. 6+2+2

(b) State the causes and remedies of soft spots fand distortions in Heat treatment.

17 Classify heat treatment furnaces based on design and their use. 10

18 (a) Explain the process of solution treatment and precipitation hardening. 8+2

(b) List Al-alloys that respond to precipitation hardening.