

- Q.25 Enlist the different tempering colors with tempering temperature.
- Q.26 Classify different types of Iron.
- Q.27 List any five advantages of solid carburizing.
- Q.28 Describe liquid carburizing
- Q.29 Explain the suitability of various quenching media
- Q.30 Explain the procedure for flame hardening.
- Q.31 Explain nitriding.
- Q.32 Describe any three defects during heat treatment processes.
- Q.33 Explain tempering.
- Q.34 Classify different types of heat treatment furnaces
- Q.35 Explain oil and gas-fired furnaces.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

- Q.36 Explain TTT diagram.
- Q.37 Explain working principle of heat treatment furnace. What are the different selection criteria for heat treatment furnaces ?
- Q.38 Explain classification of Cast Iron.

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Roll No.

5th Sem. / Branch : T&D, Found. & Forg.

Subject:- Heat Treatment

Time : 3Hrs.

M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

- Q.1 A Ferrite iron has the micro-structure as
 a) FCC b) BCC
 c) HCP d) None
- Q.2 Cast iron has carbon
 a) <2.0% b) >7 %
 c) >2.0% d) None
- Q.3 Lowest critical temperature (A₁) in iron carbon diagram is
 a) 527° C b) 727° C
 c) 911° C d) 1155° C
- Q.4 Slowest cooling is obtainable
 a) Air b) Furnace
 c) Water d) None

- Q.5 Hypo-eutectoid steel contains carbon
 a) $<0.022\%$ b) $<0.770\%$
 c) $<6.77\%$ d) None
- Q.6 All TTT diagrams are family of
 a) V shapes curves b) Z- shaped curves
 c) S-shaped curves d) None
- Q.7 _____ Furnace is not an electric furnace.
 a) Arc b) Induction
 c) Pot d) Resistance
- Q.8 Which of the following is the hardest ?
 a) Austenite b) Pearlite
 c) Bainite d) Martensite
- Q.9 In an isothermal curve, which of the following is true when the temperature is increased ?
 a) The curve shifts rightward
 b) The curve which leftward
 c) The curve goes down
 d) The curve goes up
- Q.10 Hardness of steel increases with the
 a) Increase of carbon b) Decrease of carbon
 c) By slow cooling d) NOne

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

- Q.11 Define normalizing.
- Q.12 Steel with carbon percentage is called Hyper-eutectoid steel.
- Q.13 structure is obtained if steel is quenched in water.
- Q.14 The instrument used to measure high temperature in the furnace is
- Q.15 carbon dioxide gas used in heat treatment.
- Q.16 Define quenching.
- Q.17 List any two quenching media used in heat treatment
- Q.18 Define decarburizing
- Q.19 List any two advantages of liquid carburizing.
- Q.20 Enlist two uses of nitriding.

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

- Q.21 What are the objectives of heat treatment ?
- Q.22 Draw Iron-Carbon diagram.
- Q.23 Explain annealing.
- Q.24 Describe allotropic forms of iron.