

Elective-III: Heat Treatment Technology
(Mt-804/2)

Time: 2 Hours

Full Marks: 35

*Answer any three questions. All questions carry equal marks
(Two marks for neatness)*

1. (a) Draw the TTT diagram of a 0.8 wt% C steel. How will you obtain a mixture of 50% martensite and 50% bainite in the microstructure of 0.8 wt % C steel?
(b) Differentiate between normalizing and annealing
(c) What are the purposes of tempering after hardening.
[5+3+3]
2. (a) Briefly discuss pack carburizing process? Why post-carburizing heat treatment is necessary for case carburized parts? Draw the heat treatment schedule of post carburizing parts.
(b) Describe the various techniques of flame hardening.
[(3+2+3) + 3]
3. (a) Briefly discuss overheating and burning of steel.
(b) What are the reasons for occurrence of soft spots after hardening operation of steel?
(c) How hardenability of steel is influenced by its chemistry and austenite grain size?
[4+3+4]
4. Write shorts notes on (any four) [11]
 - (a) Hadfield steel
 - (b) Stainless steel
 - (c) Tool Steel
 - (d) Transformer Steel
 - (e) Patenting
5. Distinguish between: (any three) [11]
 - (a) High temperature thermo mechanical treatment and low temperature thermo mechanical treatment
 - (b) Austempering and Martempering
 - (c) Ausforming and Isoforming
 - (d) Flame and induction surface hardening