

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(IE/ME) (Sem.-3) (Batch All)

ENGINEERING MATERIALS AND METALLURGY

Subject Code : ME-205

Paper ID : [A0860]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A**I. Write briefly :**

- (a) Define packing fraction.
- (b) What do you understand by slip?
- (c) Define allotropy.
- (d) Define toughness of a material.
- (e) What is Gibb's phase rule?
- (f) What are critical temperature lines in Iron-Carbon diagram?
- (g) Why hardening is always followed by tempering treatment?
- (h) Why alloying elements are added in steels?
- (i) What is pack carburizing?
- (j) What is tool steel?

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SECTION-B

2. Distinguish between recovery and recrystallization.
3. What are various tests through which hardness is determined? Explain any one method.
4. With the help of neat sketch, explain the effect of alloying on solid solubility.
5. Explain TTT diagram for eutectoid steel.
6. Write a note on induction hardening of steel.

SECTION-C

7. Explain various kinds of points and lines in phase diagram.
8. Draw Fe-Fe₃C equilibrium diagram, label the invariant reactions and write the various invariant reactions observed. Also write the changes in micro structure of 0.02%C steel on cooling from austenite region to room temperature.
9. What is the purpose of alloying in steels? List the alloying elements Mn, Cr, Ni and Mo in steels.

