

[Total No. of Questions: 09]

[Total No. of Pages: 02]

Uni. Roll No.

Program: B.Tech. (Batch 2018 onward)

Semester: 3rd

Name of Subject: Engineering Materials and Metallurgy

Subject Code: PCME-105

Paper ID: 16076

Scientific calculator is Allow

MORNING
13 MAY 2023

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1

- (a) List Heat treatment defects. Explain any one.
- (b) Define re-crystallization.
- (c) Discuss Peritectoid system with reaction.
- (d) Draw and label cooling curves for pure Iron.
- (e) Draw the planes (112) and (101) in body centred cubic structure.
- (f) Why tempering is done after quenching?

Part – B

[Marks: 04 each]

- Q2. Draw a BCC & HCP unit cell. Find the No of atoms and Coordination No in each.
- Q3. Explain with diagram Frenkel and schottky point defects in detail.
- Q4. Discuss Jominy end quech test.
- Q5. Can you distinguish between case hardening and surface hardening? Explain Flame hardening process in brief.

Q6. Illustrate Fe-C equilibrium diagram. Also write the important reactions occurring in Fe-C diagram.

MORNING

13 MAY 2023

Q7. Prove that Atomic packing factor of FCC structure is 74 %.

Part – C

[Marks: 12 each]

Q.8 How ferrous and Non ferrous metals are classified. Explain the effect of various alloying elements on the structures and properties of steel.

OR

Describe the Diffusion mechanisms. Explain steady state and Non steady state diffusion.

Q.9 What is TTT curve? How are they constructed? Explain how they can be applied to produce steels of different properties.

OR

Draw a diagram for temperature range of full Annealing process. Discuss step wise Annealing Process. Also explain why hypereutectoid steel is not given Full Annealing treatment.
