

B. Tech. (Mechanical Engineering), IV Semester
Materials Engineering (PCC-ME-402//21)
II Sessional Test, May 2025

Time: 90 Minutes

Max. Marks: 30

Note: Attempt all of the following questions.

Q1	Describe the cooling of 0.6 % carbon steel from 1600°C to room temperature by explaining development of microstructure(s) using Iron-Iron carbide (Fe-Fe ₃ C) equilibrium phase diagram.	(10) C03
Q2	Neatly sketch the Time-Temperature-Transformation (TTT) diagram for 0.76% (eutectoid steel). Illustrate and describe the phase transformation for isothermal cooling from 800°C to (i) 675°C (ii) 560°C (iii) 350°C and (iv) 20°C.	(10) C04
Q3	Classify and explain Nanomaterials and Shape Memory Alloys along with their applications.	(10) C05