



NAME OF THE SCHOOL
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2024-2025

SLOT: B2 +TB2

Programme Name & Branch : B.Tech – Chemical Engineering
Course Code and Course Name : BCHE 206L
Faculty Name(s) : Dr. K. Sivagami
Class Number(s) : VL2024250108356
Date of Examination : 14.10.2024
Exam Duration : 90 minutes

Maximum Marks: 50

General instruction(s):

Answer All Questions

M - Max mark; CO – Course Outcome

BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Course Outcomes

CO3 - Interpret the phase diagrams of alloys, polymers and ceramic materials.

CO4 - Analyze material characterization techniques

CO5 - Design the material manufacturing process and material property charts.

Q. No	Question	M	CO	BL
1.	A 90 wt% Ag-10 wt% Cu alloy is heated to a temperature within the β + liquid phase region. If the composition of the liquid phase is 85 wt% Ag, determine: (Figure below). (a) The temperature of the alloy (b) The composition of the β phase (c) The mass fractions of both phases	10	3	3



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2.	i) In redesigning an automobile for a new model year, 25 kg of conventional steel parts are replaced by aluminum alloys of the same dimensions. Calculate the resulting mass savings for the new model, approximating the alloy densities by those for pure Fe and Al, respectively. Use density of Fe = 7.87 Mg/m ³ and density of Al = 2.70 Mg/m ³ .	6	3	3
	ii) List out eutectic - peritectic and eutectoid reactions in solid solutions with examples.	4		
3.	A metal wire has diameter of 0.25 mm and electrical resistivity of $0.8 \times 10^{-8} \Omega \cdot m$. i) What will be the length of this wire to make a resistance 5 Ω ? ii) How much will the resistance change, if the diameter of the wire is doubled?	6	4	3
	The magnetic field at a distance r from a long wire carrying current I is 0.4 T. Determine the value of magnetic field at a distance 2r.	4		
4.	A 15 mm long and 13 mm diameter sample shows the following behavior in a tensile test. Load at 0.2% offset - 6800 kg, maximum load - 8400 kg, fracture occurs at 7300 kg, diameter and length after fracture is 8 mm and 65 mm respectively. Find the standard mechanical properties. i) Ultimate Tensile Strength ii) Breaking Stress iii) Percentage Elongation iv) Percentage area reduction	10	4	3
5.	Briefly discuss about different types of solid solutions and its intermediate phases. Also explain about the application of scanning electron microscopy in understanding the microstructure and composition of materials.	10	5	2