Model Question Paper- I

CBCS SCHEME

First/ Second Semester B.E Degree Examination,

Elements of Chemical Engineering (1BECHE105/205)

TIME: 03 Hours **Max.Marks:100**

Notes:

1. *Answer any FIVE full questions, choosing at least ONE question from each MODULE*
2. *M: Marks, L: Bloom's level, C: Course outcomes.*

		Module - 1	M	L	C
Q.1	a	Explain the role of Chemical Engineering in everyday life with suitable examples from household products, industrial goods, and community services.	10	L2	CO1
	b	Trace the history of Chemical Engineering, highlighting the evolution of the discipline from early industrial chemistry to modern process engineering.	10	L3	CO1
		OR			
Q.2	a	Elaborate on the role of chemical engineering in healthcare and pharmaceuticals.	10	L3	CO1
	b	Discuss the significance of chemical engineering in environmental protection.	10	L2	CO1
		Module – 2			
Q.3	a	Differentiate between batch processing and continuous processing with suitable industrial examples. Discuss the advantages and limitations of each.	10	L3	CO2
	b	Describe the basic principles of chemical processes with reference to material balance, energy balance, and reaction engineering.	10	L2	CO2
		OR			
Q.4	a	Explain the Solvay Process for the manufacture of soda ash. Include major reactions, raw materials, and process flow.	10	L2	CO2
	b	Explain the measurement of temperature in chemical processes, describing common instruments used.	10	L2	CO2
		Module – 3			
Q5	a	Explain the Ideal Gas Law and derive the relation PV=nRT. Discuss the assumptions and limitations of the ideal gas model.	10	L3	CO2
	b	Define closed systems and open systems in thermodynamics. Provide suitable examples and compare their characteristics.	10	L2	CO2
		OR			
	a	Explain the First Law of Thermodynamics for open systems (flow processes) with examples	10	L2	CO2

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	b	Discuss various modes of heat transfer with suitable examples from industrial processes.	10	L2	CO2
Module – 4					
Q.7	a	Differentiate between Newtonian and Non-Newtonian fluids with examples. Explain how their flow curves differ.	10	L3	CO3
	b	Explain the working principle, construction, and applications of a rotameter for flow measurement.	10	L2	CO3
OR					
Q.8	a	Define dimensional homogeneity. Explain why it is essential in engineering equations and provide examples of homogeneous and non-homogeneous equations.	10	L2	CO3
	b	Describe the rheological behavior of Non-Newtonian fluids with flow curves.	10	L2	CO3
Module – 5					
Q.9	a	Explain the importance of safety in chemical process industries. Discuss why safety must be integrated into all stages of plant operation and design.	10	L2	CO4
	b	Using Case Study of Extinction of Vultures, explain how environmental negligence leads to ecological imbalance. Discuss the role of chemicals and industrial activities in such events.	10	L4	CO4
OR					
Q.10	a	Analyze the causes and consequences of the environmental hazards in Green Project Case Study	10	L4	CO4
	b	Explain the HAZOP (Hazard and Operability) study methodology. Describe its purpose, procedure, and application in chemical industries.	10	L2	CO4