Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Seventh Semester

Chemical Engineering

CH3702 – Transport Phenomena

Regulations – 2021

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	Define viscosity and give its significance.	RE	1	2
2.	Identify the effect of viscosity on gases.	UN	1	2
3.	Write on thermal conductivity.	RE	2	2
4.	Give the effects of thermal conductivity on liquids.	UN	2	2
5.	Recall diffusivity.	RE	3	2
6.	Classify reaction systems.	UN	3	2
7.	Define momentum.	RE	4	2
8.	Write on dimensional analysis of equation of change.	UN	4	2
9.	Sketch on laminar and turbulent flows.	RE	5	2
10.	Give the effect of boundary layer and its thickness on transportation.	UN	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Explain the mechanism of momentum transport of gases and liquids.	UN	1	13
		Or			
	b	Exemplify shear stress and velocity distributions in falling film and circular tube systems.	UN	1	13
12.	a	Outline the mechanism of energy transport and the effect of pressure and temperature on it.	AP	2	13
		Or			
	b	Derive the expression for heat conduction through composite walls.	AP	2	13
13.	a	Construct the mass transport mechanism in stagnant gas film and falling film using Fick's law.	AP	3	13
		Or			
	b	Discuss the advantages and disadvantages of homo and heterogeneous chemical reaction systems.	AP	3	13

14.	a	Derive the equation of continuity and motion using mass balance equation. Give its significance.	AN	4	13
		Or			
	b	Analyze the following: a) Overall heat transfer coefficient b) Continuity Equation	AN	4	13
15.	a	Compare laminar and turbulent hydrodynamic in transportation of momentum.	AN	5	13
		Or			
	b	Summarize any two analogies in transportation of heat and mass in turbulent flow.	AN	5	13

*PART – C (Marks 1*15 = 15)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
16.	a	Derive the expressions for heat flux and temperature distribution for a spherical nuclear heat source surrounded by a spherical shell of aluminum cladding.	AN	2	15
		Or			
	b	Elucidate how the viscosity of gases at low density may be explained from the point of view of molecular theory.	AN	4	15