



	InSem Examination-II Summer 2024		
	Exam Seat No.:		
	Academic Year: 2023-2024	Semester: IV	
	Name of Programme: S.Y. B.Tech (Chemical Engineering)	Pattern: 2022	
	Name of Course: Heat Transfer	Course Code: CHE222012	
	Max. Marks: 30	Duration: 1 hr	
	Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use. 1. This question paper contains __02__ page(s). 2. Answer to each new question is to be started on a new page. 3. Assume suitable data wherever required, but justify it. 4. Draw the neat labelled diagrams, wherever necessary. 5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.		

Question No. 1 Attempt following Question

- a) Define Heat capacity, Thermal diffusivity (4) CO1

OR

- b) Explain optimum thickness of insulation (4) CO1

- c) What distinguishes fin effectiveness from fin efficiency? (5) CO1

OR

- d) What are the mechanisms of heat transfer? How are they distinguished from each other? (5) CO1

- e) A flat furnace wall is constructed of 45mm layer of sil-o-cel brick, with a thermal conductivity of $0.138 \text{ W/(m}\cdot\text{K)}$ backed by a 90 mm layer of common brick of conductivity $1.38 \text{ W/(m}\cdot\text{K)}$. Calculate the total thermal resistance considering the area of the wall as 1m^2 (6) CO1

OR

- f) Derive the steady state heat flow equation for composite Cylinder? (6) CO1

Question No. 2 Attempt following Question

- a) What is Newtonian fluid? Is water a Newtonian fluid? (4) CO2

OR

- b) How is the LMTD used to calculate the heat transfer in a parallel-flow heat exchanger? (4) CO2

- c) What is the difference between evaporation and boiling? (5) CO2

OR

- d) In which mode of heat transfer is the convection heat transfer coefficient usually higher, natural convection or forced convection? Why? (5) CO2

- e) Write short notes on condensation: Modes and features (6) CO2

OR

- f) Derive the concept of thermal resistance and how it is related to the individual and overall heat transfer coefficients in circular pipe flow. (6) CO2

XXXXXXXXXXXXXXXXXXXXXXXXXXXX