Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023

Subject Code:3143611 Date:13-07-2023

Subject Name:Basics of Heat Transfer

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define heat transfer coefficient and describe its dependence of various parameters.	**03**
	(b)	Write short notes on Forced Convection.	**04**
	(c)	Derive the expression for heat conduction in a hollow spherical vessel. State the necessary assumptions.	**07**
Q.2	**(a)**	Give the physical significance of Prandtl number	**03**
	(b)	What is black body? Give applications where this concept is used in heat transfer.	**04**
	(c)	Using Dimension analysis derive expression for natural convection for the fluid flowing inside tube in a turbulent flow.	**07**
		OR	
	(c)	Explain Reynolds analogy along with the significance.	**07**
Q.3	**(a)**	Explain Grey Body.	**03**
	(b)	Write down difference between free and forced convection	**04**
	(c)	Explain in brief various laws of radiation.	**07**
		OR	
Q.3	**(a)**	Define: transparent body, opaque body and emissivity.	**03**
	(b)	Explain construction and working of Box type furnace.	**04**
	(c)	State and derive Kirchhoff's Law for radiation.	**07**
Q.4	**(a)**	Explain the significance of LMTD correction factor.	**03**
	(b)	Write Seeder-Tate equation explaining each term	**04**
	(c)	Explain in details with neat sketch: Shell & Tube heat exchanger.	**07**
		OR	
Q.4	**(a)**	Discuss concurrent and counter current flow in heat exchangers.	**03**
	(b)	Write short notes on Natural Convection.	**04**
	(c)	Discuss various types of extended surface provided in heat exchangers.	**07**
Q.5	**(a)**	Differentiate between filmwise and dropwise condensation.	**03**
	(b)	Discuss the effect of non-condensable gases on condensation.	**04**
	(c)	Write short notes on Vapor recompression in evaporator.	**07**

OR

Q.5	**(a)**	Discuss Pool boiling of a saturated liquid.	**03**
	(b)	Discuss with the help of diagram various regimes of pool boiling.	**04**
	(c)	Classify different types of evaporator. Explain any one evaporator with a neat sketch.	**07**

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