Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER 2013

Subject Code: 140503 Date: 14-06-2013

Subject Name: Process Heat Transfer

Time: 10.30 am - 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.**

Q.1	**(a)**	Explain conduction and flow of heat through a composite wall when resistances are in series.	**07**
	(b)	Explain heat flow through cylindrical resistance in series and derive the formula for heat transfer.	**07**
Q.2	**(a)**	Discuss absorption of radiation by opaque solids.	**07**
	(b)	Discuss the various regimes of pool boiling with neat sketches.	**07**
		OR	
	(b)	Explain dropwise and film type condensation.	**07**
Q.3	**(a)**	Write short note on Forced-circulation evaporator.	**07**
	(b)	Write short note on Agitated film evaporator.	**07**
		OR	
Q.3	**(a)**	Explain in detail about capacity and economy of multiple effect evaporator.	**07**
	(b)	Discuss concept of black body. Explain in brief various laws of radiation.	**07**
Q.4	**(a)**	Write short note on double pipe heat exchanger.	**07**
	(b)	Discuss the calculation of overall heat transfer coefficient from individual coefficient for heat exchanger.	**07**
		OR	
Q.4	**(a)**	Explain with sketch, the various method of feeding in multiple-effect evaporator.	**07**
	(b)	Listing the assumption derive the equation for logarithmic mean temperature difference (LMTD) for counter flow heat transfer.	**07**
Q.5	**(a)**	With a neat sketch explain the various parts of shell & tube heat exchanger	**07**
	(b)	Explain with sketch, the various method of feeding in multiple-effect evaporator.	**07**
		OR	
Q.5	**(a)**	Hot oil (sp. Heat = 0.5 kcal/kg C) with a capacity of 5000 kg/hr flows through double pipe heat exchanger. It enters at 360 ^{0}C and leaves at 300 ^{0}C. cold fluid enters at 30 ^{0}C and leaves at 200 ^{0}C. if the overall coefficient is 800 kcal/hr m^2 C, determine the heat transfer area required for (a) parallel flow and (b) counter current flow.	**07**
	(b)	Write short note on LMTD correction factor.	**07**

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