Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(OLD) • EXAMINATION – WINTER 2016

Subject Code:142101 **Date:19/11/2016**

Subject Name:Transport Phenomena In Materials Processing

Time:02:30 PM to 05:00 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 different types of fluid flows.	**07**
	(b)	What is Newton's Law of Viscosity? Explain it and classify different types of fluids.	**07**
Q.2	**(a)**	Derive equation for differential momentum balance.	**07**
	(b)	State Euler's equation and derive Bernoulli's equation from it.	**07**
		OR	
	(b)	Derive differential mass balance equation.	**07**
Q.3	**(a)**	What are different modes of Heat Transfer? Explain Fourier Law of Heat conduction and derive unit of conductivity.	**07**
	(b)	Derive general equation of heat conduction in rectangular co-ordinates.	**07**
		OR	
Q.3	**(a)**	Explain Newton's law of cooling and differentiate between free and force convection.	**07**
	(b)	Derive equation for viscosity measurement by stoke' method.	**07**
Q.4	**(a)**	Explain planks law and wein's distribution law.	**07**
	(b)	Derive equation for radiative heat transfer between two bodies.	**07**
		OR	
Q.4	**(a)**	In terms of radiative heat transfer explain black body, emissivity, emissive power, white body and gray body.	**07**
	(b)	Explain lambart's law and Stephen boltzman law.	**07**
Q.5	**(a)**	What are different modes of mass transfer? Explain briefly.	**07**
	(b)	Derive generalized diffusion equation.	**07**
		OR	
Q.5	**(a)**	State and explain laws of diffusion.	**07**
	(b)	Write brief note on kirkindal effect and pseudo steady diffusion.	**07**

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