Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-IV Remedial Examination Nov/ Dec. 2010

Subject code: 142101

Subject Name: Transport Phenomena in Materials Processing

Date: 01 /12 /2010 **Time: 03.00 pm – 05.30 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)**	What is viscosity? State Newton's Law of Viscosity and Give Classification of fluid. Explain in brief about different fluid flows.	**07**
	(b)	(I) One liter crude oil weighs 9.6 N. Calculate specific weight and specific gravity.	**04**
		(II) Calculate the density, specific weight and weight of one liter of petrol of specific gravity 0.7.	**03**
Q.2	**(a)**	State law of conservation of mass and derive equation of continuity.	**07**
	(b)	Derive Euler's equation and obtain Bernoulli's equation by its integration.	**07**
		OR	
	(b)	Derive the equation for the viscosity measurement by stokes' method.	**07**
Q.3	**(a)**	State Newton's second law of motion and derive equation for momentum balance.	**07**
	(b)	Explain equation for flow thorough fluidized bed.	**07**
		OR	
Q.3	**(a)**	Derive equation for steady state heat conduction to a spherical pellet from an infinite stagnant fluid medium.	**07**
	(b)	What do you understand by convection? What are the types of convection? Explain.	**07**
Q.4	**(a)**	Derive heat conduction equation for composite wall.	**07**
	(b)	Explain the heat conduction in solid and state the Fourier law.	**07**
		OR	
Q.4	**(a)**	Explain: black body radiation and plank's law.	**07**
	(b)	Write in brief about Wein's distribution law and Lambert's law.	**07**
Q.5	**(a)**	Define Diffusivity. Give Fick's first law and second law.	**07**
	(b)	Discuss diffusion in gases.	**07**
		OR	
Q.5	**(a)**	Derive general equation of mass diffusion in stationary media.	**07**
	(b)	Discuss convective mass transfer between two fluids.	**07**

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