Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. - SEMESTER – III • EXAMINATION – WINTER 2012

Subject code: 131403 Date: 04-01-2013

Subject Name: Food Engineering Transport Phenomenon

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.**

Q1	**(a)**	What is fluid? Discuss its properties	**07**
	(b)	What is dimensional analysis? Discuss its applications and various dimensionless ratio.	**07**
Q2	**(a)**	Discuss pressure measurement in fluid	**07**
	(b)	Discuss similitude and model studies **OR**	**07**
	(b)	Discuss Fick's law of diffusion alongwith mass transfer Mechanism.	**07**
		OR	
Q3	**(a)**	Explain viscosity, pressure and vapour pressure.	**07**
	(b)	Discuss Reynolds's number alongwith its application. Explain resistance in fluid flow.	**07**
Q3	**(a)**	(a) Calculate the pressure due to a column of 0.3 m of (ii) Water (ρ = 1000 kg / m^3) (ii)An oil of specific gravity 0.8 (b) List types of fluid flow	**05** **02**
	(b)	(i) Explain laminar flow and turbulent flow. (ii) Describe manometers	**04** **03**
Q4	**(a)**	Discuss fluid flow concept. Also give fluid flow characteristics.	**07**
	(b)	Describe Bernoulli's equation. Also explain notches and weirs to measure fluid flow.	**07**
		OR	
Q4	**(a)**	(a) (i) The diameter of a pipe at the section 1 & 2 are 10 cm and 15 cm respectively. Find the discharge through the pipe if the velocity of water flowing through pipe at section 1 is 5 m / sec. Determine velocity at section2. (ii) Explain mechanical gauges.	**05** **02**
	(b)	Discuss capillarity and mouth piece in detail	**07**
Q5	**(a)**	Write short notes on (Any Two) 1. π Theorem 2. Pressure measurement 3. Measurement of flow in open channel.	**06**
	(b)	Answer the following. (Any Four) 1. Explain equation of continuity? 2. Explain Euler equation of motion? 3. What is dimensionless ratio? 4. What is steady fluid flow? 5. What is a model?	**08**
		OR	
Q5	**(a)**	(i) Find the discharge from a 100 mm diameter external mouth piece fitted to a side of a large vessel if the head over the mouth piece is 4 meter (Cd = 0.855). (ii) Explain Orifice	**05** **02**
	(b)	Describe venturi meter, nozzles, mouth piece, weir.	**07**

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