GUJARAT TECHNOLOGICAL UNIVERSITY
B. Pharmacy Sem - 1ˢᵗ Regular / Remedial Examination January. 2011
Subject code: 210004
Subject Name: Pharmaceutical Engineering
Date: 08 / 01 /2011   **Time: 10.30 am – 01.30 pm**
Total Marks: 80

Instructions:
1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	(a)	Write a detailed note on Reynold's experiment and Reynold's number.	**06**
	(b)	Classify flow meters. Write a note on any one of them.	**05**
	(c)	Explain the term friction. Write a note on friction and frictional losses.	**05**
Q.2	(a)	Enumerate the various modes of heat transfer. Differentiate between them with examples.	**06**
	(b)	Write a note on heat exchangers.	**05**
	(c)	Write Fourier's law. Derive an equation for rate of heat transfer when the resistances are in parallel.	**05**
Q.3	(a)	Explain the terms. 1) Stoichiometry 2) Steady state 3) Tie substance	**06**
	(b)	A simple U-tube manometer is installed across an Orificemeter. The manometric fluid is Hg (density = 13.6 gm/cc) and the flowing fluid is CCl_4 (density = 1.6 gm/cc). The manometer reads 200 mm. what is the pressure difference across the Orificemeter in N/m^2?	**05**
	(c)	Write a note on principle of mass transfer.	**05**
Q.4	(a)	Classify the conveyors. Write a note on any one of them.	**06**

	(b)	Differentiate between followings.
		   1) Unit operations – Unit processes
		   2) Dimensional equation – Dimensionless equation
			05

	(c)	Classify the pumps. Write a note on any one of them.	**05**
Q.5	(a)	Write about the gas handling system.	**06**

	(b)	A liquid with a density of $400 lb/ft^3$ flows through a long straight pipe of circular cross section at a rate of $200 ft^3/hr$. Determine the type of flow under following conditions.
		1) When the inside pipe diameter is 2 inch and the absolute viscosity
		    of the flowing fluid is 1.8 lb/hrft.
		2) When the inside pipe diameter is 1.2 ft and the absolute viscosity
		    of the flowing fluid is 3 cp.
			05

	(c)	Derive an equation for total energy balance for fluid flowing through a pipe.	**05**
Q. 6	(a)	Define corrosion. Write a note on factors affecting the corrosion.	**06**
	(b)	Classify the materials used for pharmaceutical plant construction. Write a note on factors affecting the selection of them.	**05**
	(c)	Write a note on Stainless steel as a material for pharmaceutical plant construction.	**05**
Q.7		Write short notes on following **(Any four)**	**16**
	1)	Amagat's law	
	2)	Black body	
	3)	Pitot tube	
	4)	Color coding of pipelines used in the industry	
	5)	Applications of heat transfer in industrial processes	

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