Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– V • EXAMINATION – WINTER 2016

Subject Code: 150505 **Date: 28/11/2016**
Subject Name: Fundamentals of Chemical Engineering Unit Operations
Time: 10:30AM – 01:00PM **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)**	Define Unit Operations. Briefly explain types of unit operations.	**07**
	(b)	Differentiate :- 1) Batch vs. Continuous Process 2) Unit Operations vs. Unit Processes	**07**
Q.2	**(a)**	Short Note: - Cooling Towers.	**07**
	(b)	Explain function of various parts of shell & tube heat exchanger with neat sketch.	**07**
		OR	
	(b)	Define :- 1) Kirchhoff's Law 2) Black Body 3) NPSH 4) Thermal Conductivity	**07**
Q.3	**(a)**	Describe working principle of orifice meter with neat sketch and equations.	**07**
	(b)	Briefly explain working and construction of centrifugal pump.	**07**
		OR	
Q.3	**(a)**	Working of jaw crusher with neat sketch. Explain	**07**
	(b)	What are the various modes of heat transfer? Briefly explain.	**07**
Q.4	**(a)**	Cyclone Separator. Short note	**07**
	(b)	Discuss Newtonian and Non Newtonian behavior of fluids.	**07**
		OR	
Q.4	**(a)**	With assumptions explain Bernoulli's equation for the flow of an incompressible fluid through a pipe.	**07**
	(b)	Explain liquid - liquid extraction process and selection criteria of solvent.	**07**
Q.5	**(a)**	Differentiate between drop wise and film wise condensation.	**07**
	(b)	List out various types of valves. Explain	**07**
		OR	
Q.5	**(a)**	Define: Relative Volatility. Explain – Distillation process.	**07**
	(b)	Briefly explain different types of crystallizers.	**07**

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