Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V • EXAMINATION - SUMMER 2013

Su	bject	t Code: 150505 Date: 23-05-2013	
Su	bject	t Name: Fundamentals of Chemical Engineering Unit Operations	
		10.30 am - 01.00 pm Total Marks: 70	
Ins	truction	ons: . Attempt all questions.	
	2.	. Make suitable assumptions wherever necessary Figures to the right indicate full marks.	
Q.1	(a)	Define the terms: Unit Operations, Unit Processes, Equation of State, Ideal Gas Law, Partial Pressure, Material Balance and Energy Balance.	07
	(b)	Draw a neat and labeled sketch of different parts in shell and tube heat exchanger and explain the function of any two parts.	07
Q.2	(a) (b)	Enlist different types of pump. Discuss about NPSH, cavitation and priming. Write in brief on rheological characteristics of fluid with diagram for newtonian and non-newtonian fluid.	07 07
		OR	
	(b)	With a neat sketch explain different types of valve and their application.	07
Q.3	(a)	According to the industrial application classify different types of size reduction equipment. Describe any one of them.	07
	(b)	Explain the process for removing solid particles from gas stream containing no moving parts. OR	07
Q.3	(a)	State and discuss any one main type of steam–heated tubular evaporators in	07
Q.J	(a)	current use.	07
	(b)	Depending upon the behavior of condensate on the cooled surface explain the distinct modes of condensation process.	07
Q.4	(a)	What do you understand about conduction, convection, radiation, subcooled boiling, nucleate boiling, LMTD and blackbody?	07
	(b)	List out various types of measurement of flowing fluids. Briefly discuss the construction, working principle and industrial application of any one. OR	07
Q.4	(a)	With a neat sketch of continuous fractionating distillation column explain relative volatility, reflux and q-line.	07
Q.4	(b)	Write a brief note on types of packing used in packed tower.	07
Q.5	(a)	Define liquid-liquid extraction. Explain choice of solvent for extraction.	07
	(b)	Explain the mechanism of crystallization process. OR	07
Q.5	(a)	Classify dryers based on the method of supplying heat to material. Write a short note on tray dryer.	07
	(b)	State and discuss types of water cooling tower. Draw a neat sketch of cooling tower arrangements.	07
