Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (NEW) EXAMINATION – WINTER 2021

Subject Code:2160501 Date:24/11/2021

Subject Name:Mass Transfer Operation - II

Time:10:30 AM TO 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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define : Reflux ratio, Minimum reflux ratio, Maximum reflux ratio	**03**
	(b)	Explain flash distillation briefly.	**04**
	(c)	A continuous distillation column is to be designed for separating 10,000 kg/hr of a liquid mixture containing 60 mole% water and remaining Methanol into an overhead product containing 3 mole% water and bottom product having 2% methanol. A mole reflux ratio of 3 is used. Calculate number of ideal plates. Consider feed is at its bubble point. Equilibrium data :	**07**

x	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
y	0.417	0.579	0.669	0.729	0.78	0.825	0.871	0.915	0.959

Q.2	**(a)**	Define: Absolute humidity, Saturated humidity, Relative humidity.	**03**
	(b)	Explain wet bulb temperature briefly.	**04**
	(c)	Discuss Extractive distillation.	**07**
		OR	
	(c)	Discuss Azeotropic distillation.	**07**
Q.3	**(a)**	Derive Rayleigh equation for simple distillation.	**03**
	(b)	Explain flash distillation.	**04**
	(c)	Describe various types of cooling towers.	**07**
		OR	
Q.3	**(a)**	State assumptions of McCabe Thiele method.	**03**
	(b)	Explain steam distillation.	**04**
	(c)	Describe spray chamber with figure.	**07**
Q.4	**(a)**	Define : Moisture content on wet basis, Bound moisture, Equilibrium moisture	**03**
	(b)	Explain Liquid diffusion mechanism for movement of moisture within the solid.	**04**
	(c)	Describe drum driers briefly.	**07**
		OR	
Q.4	**(a)**	Define : Moisture content on dry basis, Unbound moisture, Free moisture	**03**
	(b)	Explain Capillary movement mechanism for movement of moisture within the solid.	**04**
	(c)	Describe rotary driers briefly.	**07**
Q.5	**(a)**	List any six principal adsorbents.	**03**
	(b)	Classify types of adsorption and describe any one.	**04**
	(c)	Explain adsorption wave	**07**

OR

Q.5	**(a)**	Define: Heat of wetting, Differential heat of adsorption, Integral heat of adsorption.	**03**
	(b)	Explain adsorption hysteresis.	**04**
	(c)	Explain principle of ion exchange.	**07**

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