Name: **Roll No:** **Time: 30 Minutes**

Q1. The molar rate of liquid overflow from one plate to another is not constant over any section of the column. State whether the statement is TRUE or FALSE. [1 Marks]

Q2. Describe, (i) Pinch point in distillation (ii) Significance of R_{min}? [3 Marks]

Q3. At Total Reflux condition, feed flow into the distillation column becomes, [1 Marks]

(i) Zero
(ii) One
(iii) Infinity
(iv) None of these

Q4. In binary distillation, the separation of the component is easier if the relative volatility (α) is [1 Marks]

(i) $\alpha >> 1$
(ii) $\alpha = 1$
(iii) $\alpha << 1$
(iv) None of these

Q5. What is the significance of $y_{D, avg}$ in single stage batch distillation process? [1 Marks]

Q6. Write the Rayleigh equation with symbol and express the meaning of each symbol. [2 Marks]

Q7. Choose the behaviour of rectifying section operating line at total reflux condition [1 Marks]

a. Slope becomes infinity
b. Becomes perpendicular to diagonal line
c. Coincides with diagonal line
d. Slope becomes zero

Q8. Calculate q for a distillation feed of two components where, enthalpy of saturated vapor and saturated liquid and feed are 500.45, 300.63 and 280.56 J/mol. [1 Marks]

Q9. A mixture of acetic acid and cyclopentane is in equilibrium at some temperature. [4 Marks]

(a) Find the equilibrium composition of more volatile component at both liquid and vapor phase when the system temperature is altered to 60 °C. The mixture may be considered as ideal.

(b) Find Relative Volatility of the mixture.

Consider the given data: Boiling point of Acetic acid = 118 °C, Boiling point of cyclopentane = 49.2 °C, Antoine Equation: $\ln(p^{sat}) = a - b/(c+T)$, p^{sat} is in mm Hg and T is in °C

	a	b	c
Acetic acid	18.472	4457.83	258.46
cyclopentane	15.86	2589.2	231.36