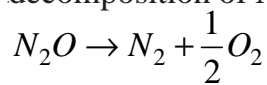


CM-605 (GS)
B.E. VI Semester Examination, June 2020
Grading System (GS)
Chemical Reaction Engineering - I
Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
 ii) All questions carry equal marks.

- Define the rate of reaction and discuss its dependence on reactant concentration.
- The decomposition of Nitrous Oxide is found to proceed as follows.



$$-r_{N_2O} = \frac{k_1(N_2O)^2}{1 + k_2(N_2O)}$$

What is the order of reaction with respect to N₂O and overall?

- Find the order and rate constant for the reaction data:

$\frac{10^3 \cdot \text{rate}}{\text{mole} \cdot \text{dm}^3 \cdot \text{min}^{-1}}$	2.0	4.2	7.8	17.5
$\frac{10^2 \cdot \text{conc}}{\text{mole} \cdot \text{dm}^{-3}}$	1.0	1.6	2.5	4.4

- Compare plug flow reactor and mixed flow reactor for finding the size of reactor for adiabatic operations with graphs.
- Define and explain the following terms:
 - Order of reaction
 - Elementary and non elementary reactions
 - Molecularity
 - Single and multiple reactions
- Write short notes on the following:
 - Segregation model
 - RTD dispersion model
- Fit the tank in series model to the following mixing cup output data to a pulse input.

t	0-2	2-4	4-6	6-8	8-10	10-12
C	2	10	8	4	2	0

- Explain Arrhenius qualitative theory for molecular reactions.
