TY-Chem

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Sept./Oct. 2019

Course: B. Tech in Chemical Engineering **Sem: V**

Subject Name: Chemical Reaction Engineering-I **Subject Code: BTCHC503**

Max Marks: 20 **Date:- 25-09-2019** **Duration:- 1 Hr.**

Instructions to the Students:

1. All questions are compulsory.
2. Question one is compulsory.
3. Solve any two from question 2 and solve any one from question 3.
4. Assume suitable data wherever required

		(Level/CO)	Marks
Q. 1	Write the rate law for the reaction $2A+B \longrightarrow C$ if the reaction		6
	1. Is second order in B and overall third order		
	2. Is zero order in A and first order in B		
	3. Is zero order in both A and B	*[Understand]*	
	4. Is first order in A and overall zero order		
	5. Is first order in C		
	6. In terms of A & B if reaction is elementary		
Q.2	**Solve Any Two of the following.**		
(A)	Activation energy of a bio-molecular reaction is about 8291 cal/mol. How much faster is this reaction takes place at 730 K than at 645 K. Consider reaction as 2A ----->Product	*[Evaluation]*	3 2
(B)	Explain general mole balance equation and based on it derive design equation for Tubular Reactor	*[Application]*	
(C)	Show that the decomposition of A is 1st order reaction and evaluate rate constant of the reaction for the data;	*[Evaluation]*	

Time (min)	0	1	2	3
C_A (mol/min)	0.16	0.113	0.08	0.056

Q. 3	**Solve Any One of the following.**		8
(A)	Show that 2/3 of initial molar flowrate F_o is fed to branch '1' having two PFRs in series, for a system of PFRs in parallel-series combination arrangement. Branch 2 which is parallel to Branch 1 has one PFR.	*[Analysis]*	
(B)	For a reaction in a batch system $aA+bB \longrightarrow cC+dD$ based on initial concentration of A, conversion of A and stoichiometric coefficients, deduce equations which will give concentration of B,C and D	*[Understand]*	

*** End ***