

Time: 1:30 Hours

Max. Marks :30

Note : Attempt all question. Use of Graph Paper is permitted. Assume suitable missing data, if any.

1[a] (i). What is "rate of reaction"? What are the factors on which the rate of reaction depends?

(ii). Differentiate between: Molecularity and Order of a reaction [5+2.5= 7.5]

[b] (i). Make a comparison between 'Transition. State Theory' and 'Collision Theory' of temperature dependency of reaction rate. Using Arrhenius Law, find out, how much faster is the pyrolysis of ethane at 650°C then at 500°C, if the value of the activation energy is 75000 cal. [7.5]

2[a] (i). Show that the decomposition of N_2O_5 at 67°C is a 1st order reaction using the integral method of analysis. Calculate the value of rate constant. The given data is :

Time (t) in min	0	1	2	3	4
Concentration of N_2O_5 , in moles/L	0.16	0.113	0.008	0.056	0.040

(ii) Using Differential method of rate analysis, find out the order of the reaction for the data given below. Also find out the value of 'rate constant'.

Data:

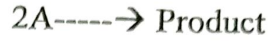
Time (t) in min	0.5	1	1.5	2	2.5	3	3.5
Concentration, (C_A) in moles/L	0.026	0.021	0.018	0.015	0.0131	0.0114	0.01

P.T.O.

Time (t) in min	4	5	6	7	8
Concentration, (C_A) in moles/L	0.009	0.0072	0.0059	0.005	0.0041

(2.5+5)= [7.5]

[b]. Differentiate between Differential method of rate analysis vs Integral method of rate analysis. Derive the integral rate equation for an irreversible second order reaction of type :



(2.5+5)= [7.5]

 END