

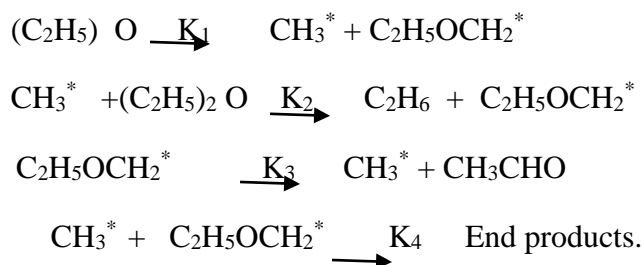
**B.E.CHEMICAL with MBA & FT 6<sup>th</sup> SEMESTER**  
**Chemical Reaction Engg I**  
**Ist Sessional (12.6.21)**

**Max Marks : 25**

**Time : 1.0 hrs**

NOTE : Attempt all questions . Assume missing data if any.

I . It has been postulated that the thermal decomposition of diethyl ether occurs by the following chain mechanism:



Show that the stationary state hypothesis indicates that the rate of decomposition is first order in ether concentration . (8)

II Develop a general expression which relates the changing total pressure of the system to the changing partial pressure of any of the reaction components for gas phase reaction with changing number of moles in a constant volume batch reactor. (7)

III The reaction  $2\text{B} \rightarrow \text{B}_2$  was carried out at a temperature of  $325^\circ\text{C}$  and at constant volume. Measurements of the total pressure as the reaction proceed yielded the following data :

T min	0	10	20	30	40	50	60	70	80
P Kpa	84.25	78.91	74.25	71.12	68.52	66.25	64.52	63.05	61.72

A rate expression is assumed as  $-\text{dp}/\text{dt} = k p^n$ . Calculate values of k and n . (10)