B.E. Chemical(3rd Year)
Chemical Reaction Engg II
Ist Sessional

Max Marks : 25 Time Allowed : 1.0 Hrs

Attempt All questions .Assume missing data if any. Date :07/06/2021

I a)Explain the various steps in a catalytic reaction.
b) Give the significance of Thiele Modulus.
c Write a note on physical adsorption and chemisorption.
d) Write briefly on void volume and pore volume distribution methods used for solid catalysts . (4)

II a) Derive concentration of reactant for a single cylindrical pore, first order reaction combined with surface kinetics. (5)
b) The rate law for the hydrogenation (H)of ethylene (E) to form ethane (A) over cobalt molybdenum catalyst is : - $r_E = kP_EP_H / (1+ K_EP_E)$. Suggest a mechanism consistent with the rate law . (6)

III The catalytic reaction $A \rightarrow 4R$, is run at 3.28 atm, 119 ^0C in a plug flow reactor which contains 0.02 Kg of catalyst and uses a feed consisting of partially converted product of 22.5 lt/hr of pure unreacted A . The results are as follows :

Run	1	2	3	4
C_{Ain} mol/lt	0.1	0.08	0.06	0.04
C_{Aout} mol/lt	0. 084	0.07	0.055	0.038.

Find a rate equation to represent this reaction. (10)