

Total No. of Questions : 10]

SEAT No. :

P3571

[Total No. of Pages : 2

[4959] - 1172
B.E. (Chemical)
Chemical Reaction Engineering - II
(2012Pattern) (End-Sem.)

Time : 2 1/2 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 4) *Assume suitable data, if necessary.*

Q1) Explain kinetic regimes for mass transfer and reaction for fluid-fluid reaction in detail. **[10]**

OR

Q2) a) Explain unreacted core model for spherical particles of unchanging in size in detail. **[5]**

b) Explain 'Film Conversion Parameter'. **[5]**

Q3) a) Give the characteristics of the catalysis. **[5]**

b) Explain pore volume and solid density. **[5]**

OR

Q4) Explain the 'pore volume distribution' in the catalyst in detail. **[10]**

Q5) Explain the following term: **[18]**

- a) Surface diffusion.
- b) Gaseous diffusion.
- c) Mass transfer with reaction in porous catalyst.

OR

P.T.O.

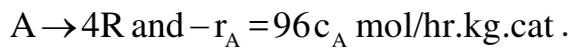
Q6) Derive the effectiveness factor of cylindrical pore catalyst. Also explain the testing method of pore resistance in the porous catalyst. [18]

Q7) a) Explain the experimental methods for finding the rates of solid-catalysed reaction. [8]

b) Explain the mechanism of fluid-solid catalytic reaction. [8]

OR

Q8) Determine the amount of catalyst needed in a packed bed reactor for 35% conversion of A to R for a feed rate of 2000 mol/hr of pure A at 3.2 atm and 117°C temperature for the reaction.



The amount of catalyst needed can be calculated for the following conditions:

a) Reactor with very large recycle rate, and

b) Reactor with no recycle rate.

[16]

Q9) a) Derive the M-M kinetic equation. [8]

b) Explain the fluidized bed reactor in detail. [8]

OR

Q10) a) Explain the procedure for determining the M-M kinetic constants in a batch or plug flow reactor. [8]

b) Explain slurry reactor in detail. [8]

