

12/5/26

(M)

Exam.Code:0434

Sub. Code: 25933

2056

M.Sc. Applied Chemistry (Pharmaceutical)

Fourth Semester

Paper – 402: Chemical Process Development

Time allowed: 3 Hours

Max. Marks: 60

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting one question from each Unit.

x-x-x

1. a) What are the various applications of chemical process on an industrial scale.
 b) Explain by-pass stream.
 c) Differentiate between elementary reactions and non-elementary reactions.
 d) Explain autocatalytic reactions.
 e) Define an ideal-batch reactor.
 f) What are pressure transducers? (6x2)

UNIT -I

2. a) Discuss natural or primary raw materials and their potential use (6)
 b) Write the uses of different chemical agents in chemical processes. (6)
3. a) Explain the various steps involved in material balance calculations. (6)
 b) Discuss the following with examples:
 a) Recycle stream
 b) Purge (3x2)

UNIT- II

4. Write a short note on:
 a) Molecularity and Order of the reaction
 b) Space time and mean residence time
 c) Elementary reaction and non-elementary reaction (3x4)
5. a) When the concentration of reactant is increased from 0.2 mol/L to 0.6 mol/L, the rate of reaction increases from 2.0×10^{-3} mol/L.s to 1.82×10^{-2} mol/L.s. Determine the order of the reaction with respect to reactant. Also calculate the value of the rate constant [k]. (6)
 b) Discuss integral and differential methods of analysis of kinetic data. (6)

UNIT-III

6. Derive the design equations for steady state mixed flow and steady state plug flow reactor. (12)
7. Discuss the factors to be considered in the selection of materials for pharmaceutical plant construction. (12)

UNIT-IV

8. Write a note on:
 a) Dip stick method (6,6)
 b) Rotating concentric cylinder viscometer.
9. Explain with diagram the construction and working of:
 a) Bimetallic thermometer
 b) Capillary Viscometer (6,6)

x-x-x