Exam. Code: 433
Sub. Code: 2965

1115

M.Sc. (Applied Chemistry/Pharmaceutical)
Third Semester
Paper – 303: Unit Pharmaceutical Operations

Time allowed: 3 Hours Max. Marks: 60

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

x-x-x

I. Attempt the following:-

a) What is mixing and agitation?

b) Discuss the role of filter aid.

c) Name industrial centrifuges.

d) What is boiling point rise?

e) Define diffusion coefficient and write its SI units.

f) Give the classification of crystallizers. (6x2)

UNIT- I

II. a) Discuss the mechanism of fluid mixing.

b) Write the construction and working of propeller mixer. (2x6)

III. a) Discuss different types of filtration processes.

b) Give the classification of filters. And discuss the working of vacuum filter. (2x6)

UNIT- II

IV. Explain the construction, working and industrial applications of basket centrifuge and sedimentation type centrifuge. Also discuss their advantages and disadvantages. (12)

V. Discuss the following:

a) Flow properties of a powder or a bulk solid

b) Compaction profiles (2x6)

UNIT – III

VI. a) What is evaporation? Give its industrial applications. State the difference between evaporation and distillation.

b) Draw a neat sketch of a rising film evaporator and label its parts. (2x6)

P.T.O.

VII. a) Write down the Fick's law of diffusion. Also discuss the applications of mass transfer operations at industrial scale.

b) Oxygen is diffusing through carbon dioxide under steady-state conditions, with the carbon dioxide non-diffusing. The temperature and the total pressure of the system are respectively 273 K and 101.3×10^3 N/m^2. The partial pressure of oxygen at two parallel, vertical planes 3 mm apart is respectively 13000 N/m^2 and 8000 N/m^2. Determine the rate of diffusion of oxygen through per m^2 of the two planes. Diffusivity of the gas mixture is 1.39×10^{-5} m^2/s. (2x6)

UNIT- IV

VIII. a) What is VLE, Dalton's law, Henry's law and relative humidity?

b) Discuss the various steps to calculate number of plates by Mc-Cabe Thiele method. Also write various assumptions. (4,8)

IX. a) Explain the mechanism of crystallization process. Also Name different types of crystallizers.

b) Discuss the mechanism of drying and develop a relation to find out time of batch drying. (2x6)

x-x-x