UKA TARSADIA UNIVERSITY

B.Pharm. (1st Semester)

Subject :030020103-Pharmaceutical Engineering (NEW)

Duration : 3 Hours **Max. Marks: 70.**

Instructions:

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks allocated to that question.
5. Draw diagrams/figures whenever necessary.

SECTION - 1

Q-1 (A) Do as directed. **[07]**

I) Convert 5 gm/cm^3 into Lb/ft^3

II) Differentiate between unit operation and unit process.

III) Write the statement of law of conservation of mass.

IV) If Reynold's number of fluid is 6000, then which type of flow is exhibited by the fluid?

V) State Steffen- Boltzmann's law of heat transfer.

VI) Explain : H.E.T.P.

VII) Define: Black body.

Q-1 (B) Answer the following in brief. (Any 4) **[08]**

I) Convert: 26 (Lb)/(hr)(ft^2)(atm) into (gm)/(sec)(cm^2)(PSI)

II) Write advantages of rotameter.

III) Differentiate between static pressure and impact pressure exerted on the fluid while flowing in pipe.

IV) Explain flash distillation and write material balance equation for the same.

V) Enlist factors affecting efficiency of plate in distillation process.

VI) Explain the concept of film in evaporation process with a neat diagram.

Q-2 Answer the following. **[10]**

A) Describe types of graphical representations used for data interpretation in pharmacy.

OR

A) Describe principle, construction, working and advantages of venturi meter.

B) Paper is passing continuously in a tray drier. The entering paper contains 10% water and leaving paper contains 6% water. How many pound of water is evaporated per hour if 100Lb/hr of paper enters into the drier?

OR

B) Calculate mole fraction of benzene and toluene in the distillate, if the mixture containing 0.60 mole fraction benzene and 0.40 mole fraction toluene distilled at 95.25ºC. At this temperature, vapor pressure of pure benzene is 1180 mmHg and toluene is 481 mmHg.

Q-3 Answer the following in detail. (Any 2) **[10]**

A) Describe principle, advantages and applications of vacuum distillation process.

B) State Fourier's law. Derive heat transfer equation for resistance in series.

C) Derive equation to calculate overall heat transfer coefficient of the film (U).

SECTION – 2

Q-4 (A) Do as directed. **[07]**

I) Define filter aid.

II) Comment: Rate of filtration is directly proportional to thickness of filter cake.

III) Explain: Boiling point rise due to hydrostatic head.

IV) Write advantage of tunnel drier.

V) Explain: Free moisture content.

VI) Enlist four factors affecting drying of wet filter cake.

VII) Enlist two applications of rotary drier.

Q-4 (B) Answer the following in brief. (Any 4) **[08]**

I) What are the applications of centrifugation process in pharmacy?

II) Efficiency of multiple effect evaporators is more compare to single pass evaporator. Justify your answer.

III) Draw a labeled diagram of rotary filter.

IV) Write principle of freeze drying process.

V) State Duhring's law for evaporation of liquid.

VI) Draw a labeled diagram of climbing film evaporator.

Q-5 Answer the following. **[10]**

A) Write a note on Drying rate curve.

OR

A) Describe principle, construction, working and advantages of spray drier.

B) Describe principle, construction, working and applications of perforated basket centrifuge.

OR

B) Describe principle, construction, working and advantages of fluid bed drier.

Q-6 Answer the following in detail. (Any 2) **[10]**

A) Describe factors affecting evaporation.

B) Write theory of solid/fluid mass transfer process.

C) Describe principle, construction, working and advantages of plate and frame filter press.