

UKA TARSADIA UNIVERSITY

B.Pharm. (1st Semester)

Subject :030020103-Pharmaceutical Engineering

Time : 10:00 am to 1:00 pm

Duration : 3 Hours

Date : 26/12/2013

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 Km/gm into mm/Kg
- II) Comment: Distillation is a unit process.
- III) Define: Stoichiometry.
- IV) Write ideal gas law.
- V) State the advantages of bubble cap plates.
- VI) What is the use of steam trap?
- VII) Explain the relationship between Reynold's number and type of flow.

Q-1 (B) Answer the following in brief. (Any 4)

[08]

- I) Convert: $26 \text{ (Hr)/(Lb)(mmHg)}^2$ into $(\text{min})/(\text{Kg})(\text{Bar})^2$
- II) Differentiate between calorie and BTU (British thermal unit).
- III) What are the disadvantages of dimensional analysis?
- IV) What is Tie substance? Explain it with suitable example.
- V) Differentiate between orifice meter and venturi meter.
- VI) Derive rate of heat transfer equation when resistances are parallel.

Q-2 Answer the following.

[10]

- A) Describe theory and applications of molecular distillation.

OR

- A) Write principle, construction, working and advantages of rotameter.
- B) The vapour pressure of water vapour is 200 mmHg in a mixture of air and water vapour. The total pressure is 740 mmHg and temperature is 160°F. What is the density of gaseous mixture in Lb/Ft^3 . (Note: molecular weight of air is 29)

OR

- B) A salt solution originally contains 4 % w/v sodium chloride in water. It is evaporated to 5% w/v solution. Calculate % of water evaporated during evaporation process.

Q-3 Answer the following in detail. (Any 2)

[10]

- A) Write principle, advantages and applications of steam distillation process.
- B) Derive total mechanical energy balance equation for fluid flow.
- C) Write advantages of steam as the heating medium. Explain following terms: a) Sensible heat and latent heat of steam and b) superheated steam.

SECTION – 2

Q-4 (A) Do as directed.

[07]

- I) Write application of filter aid.
- II) Enlist four factors affecting drying of wet granules in a tray drier.
- III) Differentiate between evaporation and distillation.
- IV) Write disadvantages of fluid bed drier.
- V) What is the advantage of freeze drying process?
- VI) Write equation to calculate rate of filtration.
- VII) A centrifuge with a diameter of 1 m rotates at a frequency of 20 sec^{-1} , calculate centrifugal effect.

Q-4 (B) Answer the following in brief. (Any 4)

[08]

- I) What are the applications of steam distillation process in pharmacy?
- II) Write ideal properties of filter aid.
- III) Differentiate between evaporation and distillation.
- IV) What is azeotropic distillation?
- V) Explain the influence of mass transfer in various unit operations.
- VI) Write a note on cartridge filter

Q-5 Answer the following.

[10]

- A) Write a note on Drying rate curve.

OR

- A) Discuss the factors affecting filtration process.
- B) Write construction, working, advantages and disadvantages of perforated basket centrifuge.

OR

- B) Write principle, construction, working and advantages of forced circulated evaporator.

Q-6 Answer the following in detail. (Any 2)

[10]

- A) Write principle, construction, working and applications of freeze drier.
- B) Write construction, working, advantages and applications of plate and frame filter press.
- C) Write a note on vacuum drier.