

UKA TARSADIA UNIVERSITY

B.Pharm. (1st Semester)

Subject :030020103 - Pharmaceutical Engineering

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) Differentiate unit operation and unit process.
- II) Define: Stoichiometry.
- III) Comment on type of flow of the fluid having Reynold's number 6799.
- IV) Write equation which represents relationship between pressure, temperature and volume of an ideal gas.
- V) Convert 33 km/hour to m/sec
- VI) Write statement of energy conservation law.
- VII) What is the function of valve placed in pipeline fittings?

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

[08]

- I) Explain material balance in unit operation with suitable example.
- II) Convert 70 lb/ft^3 to gm/cm^3 .
- III) Discuss the applications of pharmaceutical engineering in pharmacy.
- IV) Define tie substance. What is significance of tie substance in pharmacy?
- V) Enlist types of manometers used to measure pressure.
- VI) Explain the term with suitable example : Dimensionless equation

Q-2 Answer the following.

[10]

- A) Write principle, construction, working, advantages and disadvantages of rotameter.

OR

- A) Explain types of graphical representations utilised for data interpretation in pharmacy.

- B) Write principle, construction, working, advantages and disadvantages of venturimeter.

OR

- B) Write principle, construction, working, advantages and disadvantages of orificemeter.

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

[10]

- A) 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.
- B) Describe the types of pressure existing when fluid is flowing through a pipe.
- C) Derive Bernoulli's energy equation for steady flow of fluid in a pipe.

Section-2

Q-4 (A) Do as directed.

[07]

- I) Define: Black body.
- II) What is use of forklift in warehouse of industry?
- III) Enlist two advantages of chain conveyer.
- IV) State: Fourier's law
- V) Differentiate the terms: absorptivity and emissivity.

- VI) Enlist two heat exchangers.
- VII) State Stefan- Boltzman's law.

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

[08]

- I) Write equation used to calculate rate of heat transfer when resistances are in series.
Explain each term in equation
- II) Explain modes of heat transfer.
- III) Discuss colour coding of pipelines used for material transfer in industry.
- IV) Comment: Stainless steel is the best material for plant construction.
- V) Discuss construction of pneumatic conveyer with suitable diagram.
- VI) Write classification of steam traps with suitable examples.

Q-5 Answer the following.

[10]

- A) Why steam is the best heating material in pharmaceutical industry?

OR

- A) Explain principle of solid/fluid mass transfer process.
- B) Discuss types of glass used in pharmaceutical plants.

OR

- B) Discuss influence of mass transfer process in various unit operations.

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

[10]

- A) Explain factors affecting the selection of material for pharmaceutical plant construction.
- B) Write electrochemical theory of corrosion. Discuss ways to prevent it.
- C) Write construction with diagram, working and modifications of belt conveyer.