UKA TARSADIA UNIVERSITY

B.Pharm First Semester Examination Jan-2012

Subject Code: 030020103 Subject Name: Pharmaceutical Engineering

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.
5. Draw diagrams/figures wherever necessary.

Section-I

Q-1 (A) Do as directed: (07)

I) Enlist any two examples of dimensionless equation.
II) Convert $3gm/cm^3$ to lb/ft^3.
III) Write limitation of Fanning law.
IV) Convert 40PSI to gm/cm^2.
V) What is Unit Operation?
VI) Write the statement of Bernoulli's Theorem?
VII) Define Dalton's Law

Q-1 (B) Answer the following in brief: (Any 4) (08)

I) Define (i) Fluid Flow (ii) Streamline flow
II) Mention the importance of Pharmaceutical engineering.
III) What are tie substances?
IV) What is non Newtonian flow?
V) Discuss energy loss due to sudden contraction.
VI) Define stoichiometry. Give significance of "stoichiometry" in pharmacy field.

Q-2 Answer the following: (10)

A) Write the mechanisms involved in fluid flow. Explain Reynold's experiment and its significance.

OR

A) Compare and contrast Orifice meter and Ventury meter.

B) a) How many kilograms of oxygen are needed for complete the reaction of iron pyrite to give 100 kg of sulphur dioxide?
b) If 35% extra oxygen is required in the reaction then calculate total amount of oxygen needed to produce 120 kg of sulphur dioxide, then calculate total amount of oxygen required**?**
(**Note:** Balance the following chemical reaction and calculate the answer. $FeS_2+O_2 \rightarrow Fe_2O_3+SO_2$)

OR

B) A salt solution originally contains 4% by weight NaCl in water is evaporated to 5% by weight NaCl. Calculate:
(a)What is the % of water evaporated? (b) What is the % reduction in original solution?

Q-3 Answer the following in detail: (Any 2) (10)

A) State and discuss Avogadro's Law of Gases.

B) Discuss different types of graphical representation.

C) Give the construction and working of rotameter with its uses and advantages.

Section-II

Q-4 (A) Do as directed: (07)

I) Comment: Specific heat and heat capacity are same

II) Define galvanic corrosion.

III) Write the composition of glass.

IV) What is black body?

V) Write the statement and equation of Fourier's Law.

VI) Define conduction.

VII) Write the equation governing solid-fluid mass transfer.

Q-4 (B) Answer the following in brief: (Any 4) (08)

I) Describe the steel alloys used in pharmacy practice.

II) Comment: Counter current flow is better than co-current in heat transfer.

III) Write the factors to be considered in the selection of materials for pharmaceutical plant construction.

IV) State and explain Stephen Boltzmann's Law.

V) Explain briefly mass transfer phenomenon.

VI) Enlist various boundary layers that offer a resistance to convection.

Q-5 Answer the following: (10)

A) Discuss in detail the role of stainless steel in the pharmaceutical industry.

OR

A) Discuss the various methods for the prevention of corrosion.

B) Explain with diagram resistances "In series" and "In parallel" and derive the equations for both.

OR

B) With the help of a neat diagram, explain the concept of film and overall heat transfer coefficient in forced convection. Deduce relevant mathematical equations.

Q-6 Answer the following in detail: (Any 2) (10)

A) Enlist different problems of glass containers.

B) How will you use mean area and mean temperature for calculating rate of heat transfer? Derive the mathematical equation to explain the concept of mean area and mean temperature.

C) Enlist different modes of heat transfer with a suitable example for each. Describe Fourier's law.