M 8/164

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Monsoon, 2024

B. Pharm 3rd Semester Examination

Pharmaceutical Engineering – Theory

Course Code: BP304T

Full Marks – 75 **Time – 3 hours**

The figure in the margin indicates full marks for the questions.

I. Multiple Choice Questions (MCQs). **20x1=20**

(i) Which of these is NOT a mechanism for liquid mixing
- a) Bulk transport mixing
- b) Laminar mixing
- c) Shear mixing
- d) Turbulent mixing

(ii) Which one of the following is an example of pneumatic dryer?
- a) Drum dryer
- b) Freeze dryer
- c) Fluidized bed dryer
- d) Spray dryer

(iii) The filtration process is similar to the streamlined flow of a liquid under pressure through capillaries is described in which equation?
- a) Poiseuille's Equation
- b) Darcy's Equation
- c) Griffith's Equation
- d) Kozeny-Carman Equation

(iv) Sensing element is found in _____.
- a) Rota meter
- b) Orifice meter
- c) Pitot tube
- d) Venturi meter

(v) Roughness factor of badly rusted cast-iron pipe is ____.
- a) 0.6
- b) 1.0
- c) 1.6
- d) 2.5

(vi) Thermal conductivity of stainless steel is ____.
- a) 379.0
- b) 0.03
- c) 17.0
- d) 1.0

(vii) Nominal mesh aperture size (mm) of sieve number 22
- a) 4.0
- b) 710
- c) 500
- d) 355

(viii) A severe form of corrosion that develops in highly localized areas of metal surface is called as:
- a) Erosion
- b) Galvanic corrosion
- c) Pitting corrosion
- d) Stress corrosion

(ix) Which one of the following forces greatly enhances the separation forces?
- a) Brownian forces
- b) Centrifugal forces
- c) Gravitational forces
- d) Van der Waals forces

(x) Which is the filter known as edge filter?
a) Filter press b) Filter leaf
c) Meta filter d) Cartridge filter

(xi) Which is the factor that does not influence the rate of evaporation
a) Difference in vapour pressure b) Melting point of solids
c) Surface area of the evaporator d) Viscosity

(xii) Flying wheel is used to enhance the motion of particles by one of the following modes
a) Brushing b) Centrifugation
c) Gyration d) Oscillation

(xiii) In which step of the freeze drying, most of the water is removed during drying?
a) Prefreezing b) Pretreatment
c) Primary drying d) Secondary drying

(xiv) Thermolabile substances CANNOT be dried using one of the following equipment.
a) Lyophilizer b) Drum dryer
c) Tray dryer d) Spray dryer

(xv) One of the following techniques is used for sterile filtration.
a) Surface filtration b) Electrostatic filtration
c) Cake filtration d) Depth filtration

(xvi) Washing of solids is not possible in one of the following centrifuges.
a) Perforated centrifuge b) Non-perforated centrifuge
c) Semi-continuous centrifuge d) Super centrifuge

(xvii) Which metal makes the steel corrosion-resistant?
a) Chromium and nickel b) Copper and selenium
c) Titanium and niobium d) None of the above

(xviii) If the external pressure is reduced by applying vacuum, the boiling point of liquid is ___.
a) Increases b) Decreases
c) Both a & b d) Remain unchanged

(xix) Fourier's Law applies for one of the following types of heat flow.
a) Convection b) Conduction
c) Radiation d) Both a & b

(xx) Which one of the following bodies radiates maximum amount of energy at a given temperature?
a) Black body b) Grey body
c) Light grey body d) Polished black body

II. Long Answers (Answer 2 out of 3) [Word limit 400] **2x10=20**

a. Justify the Bernoulli's principle with a proper diagram and derive the equation by stating the assumptions.
b. Explain the theories of filtration and describe the principle, construction, and working of rotary drum filter.
c. Explain the theory behind drying and the rate of drying with suitable graphs.

III. Short Answers (Answer 7 out of 9) [Word limit 200] **7x5=35**

a. Define Corrosion. Briefly describe the different types of corrosion and suggest few solutions for the prevention of corrosion.

b. Validate and illustrate the principle, construction and working of a mixer which is used for the preparation of emulsions and creams of fine particles.

c. Name the different types of manometers. Illustrate the Bernoulli's principle with a proper diagram and derive the equation by stating the assumptions.

d. Enlist the various modes of size reduction? Elucidate the working of a ball mill.

e. Explain the principle and working of a centrifuge used for the separation of two liquid phases as in the case of emulsions.

f. Describe in details about the concept of fluidized bed dryer by stating the principle and working.

g. Explain the different mechanisms of heat flow and differentiate between heat exchangers and heat interchangers.

h. Explain the principle, working and uses of a climbing film evaporator.

i. Describe Reynolds model experiment in details by explaining the various types of flow patterns, when a liquid flows through a closed channel.