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2021

B.Pharm. 3rd Semester End-Term Examination

Pharmacy

PHARMACEUTICAL ENGINEERING (THEORY)

(New Regulation)

Full Marks - 75

Time - Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer for the following multiple choice questions (Answer *all* questions): (20 × 1 = 20)
- (i) Process used for separation of insoluble particles from liquids is
- (a) Drying (b) Filtration
(c) Evaporation (d) Sieving
- (ii) Which of these does not contain any filter medium
- (a) Filter leaf (b) Drum filter
(c) Filter press (d) Metafilter
- (iii) Which of the operation subsequent to evaporation?
- (a) Crystallization (b) Distillation
(c) Drying (d) Extraction
- (iv) Absolute alcohol is prepared by one of the following methods
- (a) Azeotropic distillation (b) Simple distillation
(c) Vacuum distillation (d) Steam distillation
- (v) Steam distillation is used for the separation of
- (a) Fatty acids (b) Essential oil
(c) Mineral acids (d) Petroleum fractions

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- (vi) Thermolabile substances cannot be dried using the following equipment
- (a) Lyophilizer (b) Drum dryer
(c) Spray dryer (d) Tray dryer
- (vii) Drying can be achieved at a temperature of 25-30 °C in
- (a) Freeze dryer (b) Spray dryer
(c) Fluidized bed dryer (d) Vacuum dryer
- (viii) _____ is the process of heating a liquid mixture to form vapors and then cooling them to get pure component.
- (a) Crystallization (b) Distillation
(c) Chromatography (d) Sublimation
- (ix) Which one of the following is NOT TRUE in case of construction of hammer mill?
- (a) Hammers are flat or sharp edges
(b) Hammers are rigid or swing type
(c) Metal sheet with holes or slots
(d) Woven type of screen
- (x) Ball mill works on the principle of
- (a) Impact (b) Cutting
(c) Attrition (d) Both (a) and (b)
- (xi) According to Bond's theory, the energy used in crack propagation is proportional to the
- (a) New surface area formed (b) Ratio of change in size
(c) New crack length produced (d) All of the above
- (xii) Convective mixing is also known as
- (a) Diffusive mixing (b) Macro mixing
(c) Micro mixing (d) Shear mixing
- (xiii) Centrifugal effect is expressed in one of the following ratios.
- (a) Centrifugal force to density of liquid
(b) Centrifugal force to gravitational force
(c) Centrifugal force to sedimentation force
(d) Gravitational force to sedimentation force
- (xiv) The ability of a metal surface to withstand repeated cycles of corrosion is known as:
- (a) Cavitation erosion (b) Corrosion fatigue
(c) Erosion (d) Stress of corrosion cracking

- (xv) Silverson mixer is preferentially used for the preparation of:
- (a) Elixir (b) Emulsion
(c) Mouthwash (d) Syrup
- (xvi) Which one of these instruments is suitable for measuring minute pressure difference in a fluid?
- (a) Inclined manometer (b) U-tube manometer
(c) Simple manometer (d) Diaphragm manometer
- (xvii) Reynolds number may be defined as the ratio of one of the following factors.
- (a) Elastic forces to pressure forces
(b) Gravity forces to inertial forces
(c) Inertial forces to viscous forces
(d) Viscous forces to inertial forces
- (xviii) The fluid flow in which the fluid particles in one layer DO NOT mix with the fluid particles in the other layer is called as:
- (a) Laminar flow (b) Transitional flow
(c) Turbulent flow (d) Layer flow
- (xix) Fourier's law is applicable to one of the following types of heat flow
- (a) Conduction (b) Convection
(c) Emission (d) Radiation
- (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

2. Answer any seven questions. (7 × 5 = 35)

- (a) Describe the principle, construction and working of filter press.
- (b) Explain the construction and operational details of freeze dryer. Describe its application in pharmacy.
- (c) Explain the principle of steam distillation. What are its special advantages?
- (d) Classify Evaporators. Describe the working of a film evaporator.

- (e) Explain with the help of diagram the principle, working, and uses of Cyclone separator.
- (f) What are the differences between solid and liquid mixing? Write the mechanisms of mixing in solids.
- (g) Define corrosion. What are the factors that influence the rate of corrosion?
- (h) State Fourier's law. Derive the mathematical equation to determine rate of heat transfer through a metal wall by conduction.
- (i) Describe Reynolds classic experiments elucidating different types of flow patterns, when liquid flows through a closed channel.

3. Answer any two questions: (2 × 10 = 20)

- (a) What are constant boiling mixtures? Name different types of rectifying columns. Name the characteristics of a packing material for use in fractionating columns. Explain with relevant procedure the separation of an azeotropic mixture. (1+2+2+5)
- (b) Explain with the help of diagram the principle, construction, working, uses, merits and demerits of fluid energy mill. (2+2+2+2+2)
- (c) Differentiate between fluid statics and fluid dynamics. Prove that Pressure difference is directly proportional to height difference when fluids at rest. Write applications of simple manometers. (2+6+2)