

**End Semester / Reappear (Semester III) Examination Dec 2022**

**Programme: B. Pharm**  
**Course: Pharmaceutical Engineering**  
**Course Code: BP304T**  
**Enrollment No: \_\_\_\_\_**

**Full Marks: 75**  
**Time: 3 Hrs**

**Section I**

- 1. Objective type questions. Answer all questions. 20x1=20**
- i. The properties responsible for the use of mercury in manometers is  
(a) Low vapour pressure (b) High vapour pressure (c) Low specific gravity (d) High surface tension
  - ii. The instruments suitable for measuring minute pressure differences in a fluid is  
(a) Diaphragm pressure gauge (b) Inclined manometer  
(c) Simple manometer (d) U-tube differential manometer
  - iii. The preferred mill for wet grinding is  
(a) Roller mill (b) Hammer mill (c) Colloid mill (d) Rotary cutter mill
  - iv. The modes observed in a ball mill for size reduction is  
(a) Attrition and cutting (b) Compression and impact  
(c) Cutting and compression (d) Impact and attrition
  - v. Size classification is also known in one of the following terms.  
(a) Size separation (b) Size distribution (c) Size reduction (d) Size analysis
  - vi. One of the following indicates the nominal size of aperture  
(a) Area of mesh as percentage (b) Number of meshes per linear length  
(c) Distance between two adjacent wires (d) Wire having specified diameter that gives suitable aperture
  - vii. The general equation for heat transfer rate,  $q$ , is expressed as  
(a)  $A\Delta t/U$  (b)  $U/A\Delta t$  (c)  $UA\Delta t$  (d)  $UA/\Delta t$
  - viii. The following conditions is correct for evaporation  
(a) Constituents must be thermolabile (b) Liquids must be viscous  
(c) The solvent must be non-volatile (d) Solvent must be volatile
  - ix. Calandria consists of a number of  
(a) Tubular surfaces (b) Jackets (c) Outlets (d) Baffles
  - x. Distillation operation involves one of the following steps  
(a) Vaporization (b) Vaporisation and condensation  
(c) Vaporisation, condensation and crystallization  
(d) Vaporisation, condensation, crystallization and drying
  - xi. Distillation does not involve in one of the following processes  
(a) Evaporation (b) Purification (c) Extraction (d) Separation
  - xii. For fixing the effective drying conditions, the essential processing factor is  
(a) Height (b) Temperature (c) Pressure (d) Humidity
  - xiii. The other name for lyophiliser is  
(a) Freeze dryer (b) Fluidised bed dryer (c) Spray dryer (d) Vacuum dryer
  - xiv. The following rate is observed in mixing of solids  
(a) Zero order law (b) First order law (c) Second order law (d) None
  - xv. Mechanism of mixing in sigma blade mixer:

- (a) Connective                      (b) Tumbling                      (c) Shearing                      (d) Diffusion
- xvi. Filtration is a unit operation that is commonly used for collecting  
 (a) Slurry                      (b) Particulate matter                      (c) Precipitate                      (d) Filtrate
- xvii. The theory that filtration process is like the streamlined flow of liquid under pressure through capillaries was proposed by  
 (a) Poiseuille                      (b) Darcy                      (c) Kozeny                      (d) Carman
- xviii. The separation process in which the amount of solid in a liquid is not more than 1% w/v is called  
 (a) Filtration                      (b) Clarification                      (c) Centrifugation                      (d) Evaporation
- xix. The principle difference (in the properties) that influences centrifugation  
 (a) Particle size                      (b) Interfacial tension                      (c) . Densities                      (d) Viscosities
- xx. Corrosion can be prevented by  
 (a) Alloying                      (b) Tinning                      (c) Galvanizing                      (d) All of these

### Section II

**2. Short Answer type questions. Answer any five. 5x7=35**

- a. Explain the construction and working of differential manometer.
- b. Discuss the principle and application of steam distillation.
- c. Discuss measures to check problems of corrosion.
- d. Write a note on pharmaceutically acceptable glass.
- e. Give the objectives of size reduction & its pharmaceutical importance.
- f. With the help of neat and labeled diagram discuss the working of shell and tube heat exchanger.
- g. Define centrifugation. Give applications of centrifugation.

### Section III

**Long Answer type questions. Answer any two. 2x10= 20**

3. Derive Bernoulli's equation stating its assumptions. Give its applications.
4. Define evaporation. Discuss the principle, construction and working of climbing film evaporator.
5. With the help of a neat and well labeled diagram discuss the principle and working of a freeze dryer.

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