

Course: B.Pharm.

Semester: III

Subject with Subject Code: Pharmaceutical Engineering (BP304T)

Date: 26/12/2018

Marks: 75

Duration: 3hrs

**Instructions:** i) All questions are compulsory

ii) Figures to the right indicate full marks

iii) Draw the diagrams or flow charts wherever necessary.

**Q.No.1 Attempt the following questions (All Questions Compulsory)**

**(20 Marks)**

1. Austenitic consists of
  - A. 13 to 20% Chromium + 6 to 22% Nickel + 0.1 to 0.25% carbon
  - B. 12 to 20% Chromium + 2% Nickel + 0.2 to 0.4% carbon
  - C. 20 to 40% Chromium + 12% Nickel + 1 to 2% carbon
  - D. 15 to 30% Chromium + 0.1% carbon
2. Commonly used ball for pebble mill are
  - i) Round ball,                      ii) Rods                      iii) Needle
  - A. Only i are used
  - B. All ii & iii are used
  - C. i & ii are used
  - D. All of these are used.
3. Which of the following is false for reflux ratio for High efficiency of fractional distillation?
  - A. It is controlled by means of a suitable still.
  - B. It should be low.
  - C. The quotient of the amount of liquid returning through the column to the amount collected into the receiver during the same interval of time.
  - D. It should be high.
4. As per Indian official standard Moderately fine powder is
  - A. All particles must pass through sieve no 44 and 50 % particles pass through sieve no 85.
  - B. All particles must pass through sieve no 44 and 60 % particles pass through sieve no 85.
  - C. All particles must pass through sieve no 44 and 50 % particles pass through sieve no 60.
  - D. All particles must pass through sieve no 44 and 40 % particles pass through sieve no 85.
5. Free moisture content is
  - A. Total water content minus equilibrium moisture content.
  - B. Total water content plus equilibrium moisture content.
  - C. Ratio of Total water content to the equilibrium moisture content.
  - D. Total water present in solid minus water in environment.

6. The Liquid mixing mechanism are
  - A. Bulk transport
  - B. Turbulent mixing
  - C. Molecular diffusion
  - D. All of these
7. The value of Reynold's number for turbulent flow is
  - A. <2000
  - B. 2000-4000
  - C. >4000
  - D. <1000
8. Ultracentrifuge shows
  - A. 85000 revolutions per minutes
  - B. 8500 revolutions per minutes
  - C. 10000 revolutions per minutes
  - D. 850 revolutions per minutes
9. Which of following is not advantage of rising film evaporator?
  - A. The enhanced heat transfer.
  - B. Suitable for foam forming liquids.
  - C. Large area for heat transfer is provided.
  - D. Not suitable for heat sensitive material.
10. In centrifuges the driving forces for separation of solids are
  - A. Centrifugal force
  - B. Both Centrifugal force & Gravitational force
  - C. Gravitational Force
  - D. None of these.
11. As per Fourier's law of convention rate of heat transfer through a uniform material is
  - A. Directly proportional to the length of uniform material.
  - B. Inversely proportional to the temperature difference.
  - C. Inversely proportional to the area of uniform material.
  - D. Directly proportional to the temperature drop.
12. Planetary mixer is are example of
  - A. Agitator mixer
  - B. Solid mixer
  - C. Shear mixer
  - D. All of these
13. Impingement, Entanglement & Straining are related to
  - A. Mixing
  - B. Centrifugation
  - C. Filtration
  - D. All of these
14. The conveyers for transportation of solids are
  - A. Belt conveyors
  - B. Chain conveyors
  - C. Screw conveyors
  - D. All of these
15. The bacteria used to test membrane filters of Pore size 0.3 ( $\mu\text{m}$ ) are
  - A. *Serratia marcescens*
  - B. *Pseudomonas aeruginosa*
  - C. *Pseudomonas diminuta*
  - D. *Saccharomyces cerevisiae*
16. Ball mill shows the principle
  - A. Impact
  - B. Compression
  - C. Impact & attrition
  - D. Crushing & sharing
17. Mixing device technically called as
  - A. Impellers
  - B. Turbines
  - C. Paddles
  - D. All of these.

18. The rate of evaporation is
- A. Inversely proportional to atmospheric pressure
  - B. Inversely proportional to temperature.
  - C. Inversely proportional to the vapour pressure of liquid.
  - D. Inversely proportional to the surface area for evaporation.

19. Tunnel dryer is variant of

- A. Rotary drum dryer.
- B. Fluidized bed dryer.
- C. Tray dryer.
- D. Spray dryer.

20. Raoult's law is related to

- A. Vapour pressure
- B. Atmospheric pressure
- C. Osmotic pressure
- D. All the above

**Q.No.2 Attempt any TWO questions of the following: (20 Marks)**

- A] Derive Bernoulli's equation. Discuss its applications.
- B] Discuss in detail various modes of heat transfer. Draw a neat diagram of shell & tube heat exchanger & explain its working.
- C] List the factors influencing the rate of filtration. Explain construction, working & applications of filter press with a neat diagram.

**Q.No.3 Attempt any SEVEN questions of the following: (35 Marks)**

- A] Explain theories of corrosion.
- B] Discuss construction, working, application & advantages of with a neat labeled diagram of fluidized bed dryer.
- C] Draw a neat diagram of bag filter & explain its working.
- D] Classify evaporators and explain economy of multiple effect evaporators in comparison to single effect evaporator.
- E] List the equipments used for solid mixing in pharmaceutical industry. Explain construction & working of Sigma blade mixer.
- F] Discuss the principle & application of centrifugation.
- G] Discuss any five factors affecting evaporation.
- H] With help of a neat diagram explain construction, working, application & advantages of fluid energy mill.
- I] What is meant by steam distillation? What are its special advantages?

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