

09-01-2019

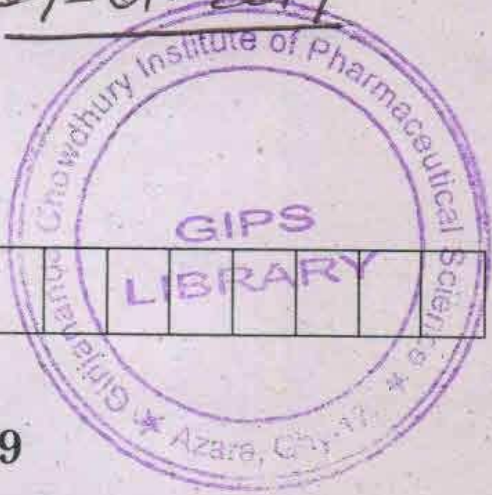
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2019



B.Pharm 3rd Semester End-Term Examination
PHARMACEUTICAL ENGINEERING – Theory
(New Regulation)
(w.e.f. 2017-2018)

Full Marks – 75

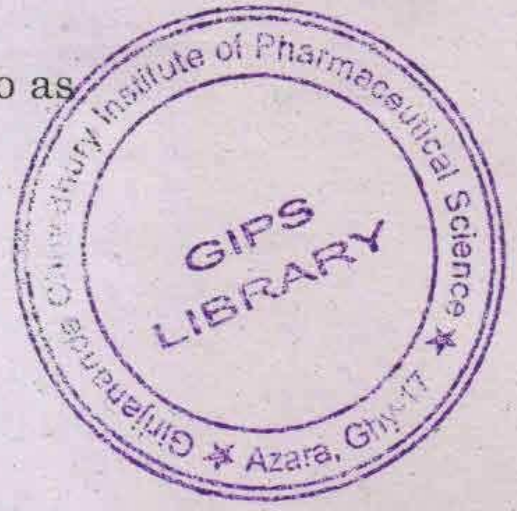
Time – Three hours

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

1. Answer ALL questions : (20 × 1=20)
- (i) If the arrangements of a plate and frame filter press is shown as 1.2.3.2.1.2.3.2.1 (1 for plate, 2 for frame, 3 for wash plate), then the sequence indicates
- (a) Loading in progress
 - (b) Filtration in progress
 - (c) Washing in progress
 - (d) Unloading in progress

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- (ii) Which one of these does not contain any filter medium
- (a) Filter leaf
 - (b) Metafilter
 - (c) Filter press
 - (d) Drum filter
- (iii) Evaporation from surface of any liquid depends on
- (a) temperature
 - (b) surface area
 - (c) time
 - (d) all of above
- (iv) According to IP 1996, determination of water content in a substance using toluene can be done through
- (a) Fractional distillation
 - (b) Azeotropic distillation
 - (c) Molecular distillation
 - (d) Differential distillation
- (v) Pyrolysis is a process in which organic matter of waste is converted into gas by
- (a) extractive distillation
 - (b) destructive distillation
 - (c) differential distillation
 - (d) molecular distillation



- (vi) Micromixing is referred to as
- (a) Shear mixing
 - (b) Geometric mixing
 - (c) Diffusive mixing
 - (d) Convective mixing
- (vii) Which one of the following is used in wet granulation process
- (a) Ribbon blender
 - (b) V cone blender
 - (c) Double cone blender
 - (d) Sigma blade mixer
- (viii) Which one of the following is true in parallel flow heat exchangers
- (a) the exit temperature of hot fluid is always equal to the exit temperature of cold fluid
 - (b) the exit temperature of hot fluid is always less than the exit temperature of cold fluid
 - (c) the exit temperature of hot fluid is always more than the exit temperature of cold
 - (d) we cannot predict comparison between exit temperature of hot fluid and cold fluid

- (ix) Identify the substance that has highest thermal conductivity among four
- (a) Silver
 - (b) Steel
 - (c) Aluminum
 - (d) Glass
- (x) _____ process is also called as Diminution.
- (a) Drying
 - (b) Size separation
 - (c) Size reduction
 - (d) Mixing
- (xi) Aperture tolerance average means
- (a) Area of the mesh as a percentage of the total area
 - (b) Unavoidable variation in the aperture size
 - (c) Number of meshes per unit linear length
 - (d) Average value of the aperture sizes in an area of 25.4 mm^2
- (xii) Drying can be achieved at a temperature of $25\text{-}30^\circ\text{C}$ in
- (a) Freeze dryer
 - (b) Spray dryer
 - (c) Fluidized bed dryer
 - (d) Vacuum dryer

(xiii) Developing of electrostatic charges of some organic powders is a disadvantage of

- (a) Fluidized bed dryer
- (b) Vacuum dryer
- (c) Spray dryer
- (d) Lyophilizer

(xiv) The triple point of water exist at

- (a) 0.098°C and 0.533 kp
- (b) 0.0098°C and 0.533kp
- (c) 0.0098°C and 533.0 kp
- (d) 0.098°C and 533.0 kp

(xv) The suitable metal used in making of collapsible tube is

- (a) Aluminium
- (b) Lead
- (c) Cast iron
- (d) Austenitic stainless steel

(xvi) Tablet dies and punches are plated with

- (a) Nickel
- (b) Chromium
- (c) Stainless steel
- (d) Lead

(xvii) Vena contracta in flow lines results in

- (a) Increased velocity, increased pressure head
- (b) Decreased velocity, increased pressure head
- (c) Increased velocity, decreased pressure head
- (d) Decreased velocity, decreased pressure head

(xviii) One of the following device is also known as area meter, identify it

- (a) Orifice meter
- (b) Venture meter
- (c) Pitot tube
- (d) Rotameter

(xix) Anodic protection is achievable through

- (a) Sacrificing anode
- (b) Sacrificing cathode
- (c) Impressed emf
- (d) Passivating potential

(xx) Reason for Fretting corrosion

- (a) When metals slide over each other and cause mechanical damage to one or both
- (b) At surface, if tensile strength is more than the yield stress the surface develops crack
- (c) Residual internal stress in the metal
- (d) The metal surface is stressed and simultaneously attacked by the corrosive media

2. Answer any seven (07) question.

- (a) Describe the construction of a Rotary drum filter. Give its advantage, disadvantage and use.
- (b) All size reduction equipment has its own merits and demerits. Give a comparison of such merits and demerits.
- (c) What are the various grades of powders official in pharmacopoeia.
- (d) Describe the construction and working of a forced circulation evaporator.
- (e) What are constant boiling mixtures? Draw typical boiling diagrams for constant boiling mixtures.
- (f) Explain the principle of freeze dryer. List the pharmaceutical applications of freeze dryer.
- (g) Describe the steel alloys and mention their applications
- (h) Classify industrial centrifuge. Describe construction and working of perforated basket centrifuge.
- (i) Write electrochemical theory of corrosion. What is anodic protection?

3. Answer any two (02) of the following (2 × 10 = 20)

- (a) Give the mechanisms of solid mixing and liquid mixing. Draw a neat sketch of the sigma blade mixer and write how it works. What is vortex formation and suggest one method to prevent vortex formation. (3+4+3)

- (b) Give the statement of Fourier's Law. What are Black body and Gray body? What is film coefficient? Derive an equation for heat transfer by conduction through compound resistance in series. (1+2+3+4)
- (c) What are different ways of energy loss in fluid flow? Give an equation to calculate energy loss. What is Reynolds number and what is its importance? Explain Bernoulli's theory with relevant equation and drawing. (1+1+3+5)
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