

Name:		 UPES UNIVERSITY OF TOMORROW	
Enrolment No:			
UPES End Semester Examination, December 2025			
Program: B. Pharm		Semester : III	
Course: Pharmaceutical Engineering		Duration : 03 Hours	
Course Code: BP304T		Max. Marks: 75	
Instructions: Attempt all sections.			
SECTION A (20Q×1M=20 Marks) Attempt all questions. Each question carries one mark.			
S. No.		Marks	COs
Q 1	Mention the Reynolds number for a fluid exhibiting transitional flow.	1	CO1
Q 2	A powder passes 100% through sieve #22 but only 30% through sieve #44. The powder grade is closest to: A. Coarse B. Fine C. Moderately fine D. Moderately coarse	1	CO1
Q 3	The velocity profile in laminar flow across a pipe is: A. Flat with sharp edges B. Uniform B. Parabolic with max at center D. Irregular	1	CO1
Q 4	What does sieve number 10 indicate?	1	CO1
Q 5	In a Rotameter, the float rises until: A. Static pressure = atmospheric pressure B. Velocity = constant B. Upward drag force = downward weight C. Pressure loss = zero	1	CO1
Q 6	In _____, heat is transferred through electromagnetic waves and does not require a medium.	1	CO2
Q 7	In a heat interchanger, finned tubes are mainly incorporated to: A. Increase the overall heat-transfer surface B. Admit steam into the system C. Allow entry of the cooling medium D. Reduce the overall apparatus dimensions	1	CO2
Q 8	The object that emits the highest possible thermal radiation at a given temperature is: A. A perfect black body B. A grey body C. A light-grey surface D. A polished black surface	1	CO2
Q 9	Identify a major drawback of using a steam-jacketed kettle: A. High thermal efficiency B. Inability to operate under reduced pressure B. Lower installation expenditure D. Universally suitable for all liquid types	1	CO2
Q 10	The most suitable evaporator for concentrating a corrosive liquid that crystallizes during processing is: A. Falling film evaporator B. Forced-circulation evaporator C. Horizontal film evaporator D. Vertical-tube evaporator	1	CO2
Q 11	The critical moisture content corresponds to which point on the drying curve? A. When equilibrium moisture is reached B. When surface starts forming dry spots C. When drying rate becomes zero D. When surface temperature begins to fall	1	CO3
Q 12	In vacuum drying, drying rate increases because: A. Heat transfer coefficient increases B. Water evaporates at higher temperature C. Boiling point decreases D. Internal diffusion increases	1	CO3

Q 13	Name the mechanism in which adjacent particles (in a powder bed) are transferred to another location. A. Convective mixing C. Negative mixing B. Diffusive mixing D. Positive mixing	1	CO3
Q 14	Select the blender that relies purely on gravitational force for particle movement: A. Ribbon blender C. Double-cone blender B. Sigma blade mixer D. Turbine mixer	1	CO3
Q 15	Semi-solid materials are best mixed using: A. Turbine B. V-cone blender C. Sigma blade mixer D. Propeller	1	CO3
Q 16	Plate & Frame Filter Press operates on: A. Depth filtration C. Sedimentation B. Surface filtration D. Centrifugal action	1	CO4
Q 17	Choose the filter that has pore sizes as small as 0.2 μm for bacteria-proof filtration: A. Rotary drum filter B. Seitz filter C. Membrane filter D. Leaf filter	1	CO4
Q 18	Filter aids such as kieselguhr function mainly to: A. Increase viscosity C. Sterilize filtrate B. Increase porosity of cake D. Reduce solubility	1	CO4
Q 19	Define clarification.	1	CO4
Q 20	Write the expression for Poiseuille's equation for filtration.	1	CO4
SECTION B (20 Marks) (2Q×10M=20 Marks) Attempt 2 Question out of 3.			
Q 1	Illustrate and describe the principle, construction, working, applications, advantages and disadvantages of spray dryer with help of a labeled diagram.	10	CO3
Q 2	Illustrate and describe the principle, construction, working, applications, advantages and disadvantages of flash distillation with help of a labeled diagram.	10	CO2
Q 3	Attempt any two of the following: a) Differentiate between differential centrifugation and density-gradient centrifugation. b) Write the working principle of a filter leaf with a labelled diagram. c) What is meant by filter media? Mention its characteristics with examples.	5+5	CO4
SECTION C (35 Marks) (7Q×5M=35 Marks) Attempt 7 Question out of 9.			
Q 1	Describe the principles and applications of a rotameter using a labeled diagram.	5	CO1
Q 2	Explain the principle and construction of a ball mill.	5	CO1
Q 3	Describe the working of a bag filter with the help of a labelled diagram.	5	CO1
Q 4	Write the principle, working and application of non-perforated basket centrifuge.	5	CO4
Q 5	Discuss the principle and construction of double cone blender using a labelled diagram.	5	CO3
Q 6	Explain the working of a horizontal-tube evaporator with the help of a labelled diagram.	5	CO2
Q 7	Discuss Fourier's law of heat transfer. How will the rate of heat flow through a metal column be affected if its cross-sectional area is reduced to half and its length is doubled?	2+3	CO2
Q 8	Define Reynolds number. Describe the method to determine the Reynolds number for a flowing fluid.	5	CO1
Q 9	Write the composition and classification of glasses used in the pharmaceutical industry.	5	CO5