

CHEMICAL ENGINEERING DEPARTMENT



**FAQ ON UPSTREAM PROCESS
ENGINEERING
BBTPC5030**

6TH SEM –CHEMICAL ENGINEERING

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY
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Unit:1

1. What are particulate solids?
2. What are the important properties of particulate solids?
3. How does particle size affect handling of particulate solids?
4. What is meant by flowability of particulate materials?
5. What problems are encountered in handling particulate solids?
6. What is size reduction in particulate processing?
7. What are the objectives of size reduction?
8. What is a crusher and what is its working principle?
9. What is a grinder and how does it work?
10. What is a pulveriser?
11. Differentiate between crusher, grinder, and pulveriser.
12. What are the main forces involved in size reduction?
13. What factors influence the efficiency of size reduction equipment?
14. What is screening in particulate processing?
15. State the principle of screening.
16. What are the different types of screening equipment?
17. What is particle size distribution?
18. How is particle size distribution determined?
19. What is sieve analysis?
20. Why is particle size distribution important in industrial processes?

Unit:2 (Liquid Fuels)

1. What is meant by a fluid as a continuum?
 2. Why is the continuum concept important in fluid mechanics?
 3. How are fluids classified based on their properties?
 4. What is fluid statics?
 5. State the basic equation of fluid statics.
 6. Explain the equilibrium of a fluid element at rest.
 7. What is hydrostatic pressure?
 8. How does pressure vary with depth in a static fluid?
 9. What are the different pressure measuring devices?
 10. Explain the working principle of a manometer.
 11. What is boundary layer flow?
 12. How is a boundary layer formed over a flat plate?
 13. Explain the growth of boundary layer in tubes.
 14. What is the continuity equation of fluid flow?
 15. State the momentum equation of fluid flow.
 16. Write Bernoulli's equation and state its assumptions.
 17. What is a Venturi meter and how does it measure flow?
 18. What is an orifice meter?
 19. Explain the working principle of a Pitot tube.
 20. What is a rotameter and where is it used?
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Unit:3

1. What is heat transfer?
2. What are the basic modes of heat transfer?
3. State the basic laws governing heat transfer.
4. What is conduction?
5. State Fourier's law of heat conduction.
6. Derive the steady-state one-dimensional heat conduction equation for a plane wall.
7. Explain steady-state heat conduction through a cylindrical wall.
8. Explain steady-state heat conduction through a spherical wall.
9. What is meant by heat conduction through composite structures?
10. What are extended surfaces (fins)?
11. Why are fins used in heat transfer applications?
12. What is critical thickness of insulation?
13. Explain the concept of critical radius of insulation.
14. What is convection?

15. Differentiate between natural and forced convection.
16. What is Grashof number and what is its significance?
17. Explain natural convection from vertical and horizontal surfaces.
18. What is forced convection?
19. Define convective heat transfer coefficient.
20. What are heat exchangers and what is meant by log-mean temperature difference (LMTD)?

Unit:4

1. What is meant by mass transfer operation?
2. Why is mass transfer important in chemical engineering processes?
3. What is molecular diffusion?
4. What is a binary solution?
5. State Fick's first law of diffusion.
6. State Fick's second law of diffusion.
7. What is the equation of continuity in mass transfer?
8. What is steady-state diffusion?
9. Explain equimolar counter-current diffusion.
10. What are the assumptions involved in equimolar counter-current diffusion?
11. What is the Stefan–Maxwell equation?
12. How does Stefan–Maxwell equation differ from Fick's law?
13. What is diffusivity?

14. What factors affect diffusivity of gases?
15. What factors affect diffusivity of liquids?
16. What are the typical values of diffusivity for gases and liquids?
17. What are the applications of molecular diffusion?
18. What is mass transfer coefficient?
19. How does mass transfer occur in laminar flow?
20. How does mass transfer differ in turbulent flow?

Unit:5(Combustion)

1. What is interphase mass transfer?
2. Explain the concept of phase equilibrium in mass transfer operations.
3. What is film theory of mass transfer?
4. What are the assumptions of film theory?
5. What is penetration theory of mass transfer?
6. How does penetration theory differ from film theory?

7. Explain the surface-renewal theory of mass transfer.
8. Compare film, penetration, and surface-renewal theories.
9. What is meant by analogy between mass, heat, and momentum transfer?
10. State the Reynolds, Prandtl, and Schmidt number analogy.
11. What is relative volatility?
12. What are ideal solutions?
13. What is an azeotrope?
14. What is an enthalpy–concentration diagram?
15. What is flash vaporization?
16. What is partial condensation?
17. What is differential distillation?
18. Explain the principle of steam distillation.
19. What is azeotropic and extractive distillation?
20. What is continuous distillation and where is it used?