

INTRODUCTION TO CHEMICAL ENGINEERING

1. Chemical engineers have contributed substantially more than any other engineering disciplines in advancing the quality of life. Justify this statement citing three examples from everyday life.
2. Thermal conductivity of copper is 9.2×10^{-2} Kcal/ (m.s.0C). Express it in W/ (m.K)?
3. Minerals occur in the nature with large proportion of undesired products. Which method can be adopted for the recovery of minerals?
4. Distinguish between laminar flow and turbulent flow?
5. Using appropriate diagram explain how a U tube manometer works?
6. What is the principle of operation of a thermocouple?
7. What are the major objectives of waste water management?
8. Chemical industries are more vulnerable to accidents. List any three major hazards that can possibly occur in a chemical process industry?
9. What is the role of Chemical engineers in controlling atmospheric pollution?
10. A solution of caustic soda contains 20% NaOH by weight. Taking the density of solution as 1.196 Kg/L. Find (i) Molarity (ii) Normality (iii) Molality of the solution?
11. Which unit operation can be adopted for the bringing dilute sugar solution to saturation before crystallization? With a neat sketch explain the working of equipment used for the purpose?
12. Differentiate physical adsorption and chemical adsorption?
13. What is the mode of heat transfer occurring in solids? State the law governing that mode of heat transfer?
14. With neat sketch classify ideal reactors?
15. With the help of a neat block diagram explain the working of a feedback controller used in process industries?
16. Schematically represent a venturi meter with pressure tapings and deduce the equation to find average velocity using first principles?
17. The Bhopal Gas Tragedy, 1984 was a catastrophe that had no parallel in the world's industrial history. What are the major reasons that led to the tragedy? As a chemical engineer, suggest some safety measures that could have been adopted to avoid the disaster?

18. Explain with a neat diagram, the working of activated sludge process for secondary waste management?
19. Differentiate batch process and continuous process. What are the major stages involved in the development of a process in a chemical industry?
20. Write a note on role of Chemical engineers in Chemical process industries.
21. Define an ideal gas. What are equations of state? Write any three equations explaining each term.
22. What are the different methods of expressing composition of a solution? The analysis of magnesite ore obtained yields 81% MgCO_3 , 14% SiO_2 , and 5% H_2O by mass. Convert this composition into mole%.
23. Biodiesel can be used as an alternative to petroleum diesel. What are the steps involved in the production of biodiesel.
24. Compare and contrast centrifugal and reciprocating Pump.
25. With neat diagram explain DCDA process for Sulphuric acid manufacture. List the advantages of DCDA process over contact process.
26. The chemical industry is a key sector for sustainable development. What you mean by sustainability. How it can be achieved in a chemical industry.