

- 1.(a) Compare plastics with metals as materials of plant construction. (7)
- (b) Explain steady state and unsteady state. (3)
- (c) Discuss the different factors that influence the rate of corrosion. (4)

OR

- (d) Define (i) Unit operations (ii) Unit processes. (3)
 - (e) Classify and enumerate the different types of corrosion. (4)
 - (f) Discuss the factors to be considered in the selection of materials for plant construction. (7)
- 2.(a) Derive an equation for the overall heat transfer coefficient when a liquid is heated by another liquid through a metal wall. (7)
 - (b) Write a note on Bernoulli's theorem. (7)

OR

- (c) Write a note on
 - (i) Heat interchangers (6)
 - (ii) Flow meters (4)
 - (iii) Entrainment separators (4)
- 3.(a) Explain the design and operation of centrifugal pump. (7)
 - (b) Describe the construction, working of belt conveyor systems. Add a note on its advantages and limitations. (7)

OR

- (c) Compare reciprocating pumps with centrifugal pumps. (5)
 - (d) Write a note on
 - (i) Ejectors (ii) Fittings (iii) Vacuum pumps (9)
- 4.(a) Define: (6)
 - (i) Humidity (ii) Relative Humidity (iii) Saturated Humidity
 - (b) Describe a refrigeration system using a compression refrigeration system with a neat labelled diagram. (8)

OR

- (c) What are cooling towers? Explain their design and operation.
 - (d) Discuss the factors that determine the refrigeration load in pharmaceutical plant.
 - (e) What is coefficient of performance of a refrigeration system?
- 5.(a) What are filter aids? What are the characteristics of an ideal filter aid? (6)
 - (b) Describe the stream line filter and advantages and applications of it. (8)

OR

- (c) Write a note on : (6)
 - (i) Membrane filters (ii) Seitz filter
- (d) What is critical speed of centrifuge and write its significance in the operation of centrifuge. (8)
