



Q.1. Give short answers of the following: (15x2=30)

- (i) Write down the balanced chemical equations used in the manufacturing of soda ash by Solvay's process.
- (ii) Write down the various reactions taking place during the hydration process of cement.
- (iii) You are provided with the following mixtures, which technique you would use to separate the (i) Chalk powder and water (ii) Sodium chloride and water (iii) Ethyl alcohol and water
- (iv) Write the names of methods to measure the water hardness.
- (v) Differentiate between sludge and scale.
- (vi) Name the different types of cement and their possible uses.
- (vii) Draw a labelled diagram of Nelson's cell.
- (viii) Why natural cement is used very limited?
- (ix) Write the names of different zones of rotary kiln in manufacturing of cement.
- (x) What are the water softeners?
- (xi) Write down the names of the different industrial processes used for the manufacturing of caustic soda.
- (xii) Write down the industrial applications of washing soda.
- (xiii) Write down the different modes of heat transfer and how they differ from each other.
- (xiv) Write down the advantage of 'wet process' over 'dry process' in the manufacturing of Portland cement.
- (xv) Write down any four methods used for removal of boiler scales.

Answer the following questions.

- Q No. 02.** (a) Explain the Solvay's process for the manufacturing of soda ash with flow sheet diagram. (06)
- (b) Write down an ion exchange method for softening of water. (04)
- Q No. 03.** (a) What are boiler scales. Discuss their formation and how the scale formation in boiler can be suppressed. (07)
- (b) Describe the working principle of tube and shell heat exchanger (03)
- Q No. 04.** (a) Write down the contact process of sulphuric acid manufacturing with flow sheet diagram. (07)
- (b) Describe the mechanism of heating of room by an electric heater. (3)