

(3 Hours)

[Total Marks: 80]

- N.B:
- (1) Question No.1 is compulsory.
 - (2) Answer any three questions from Question Nos.2 to 6.
 - (3) Assume suitable data if necessary.

1 Answer any FOUR of the following questions:-

- (a) Justify-Vapor recompression enhances the efficiency of evaporators. 5
- (b) Explain the need of vacuum distillation. How pressure control is achieved in such type of distillation. 5
- (c) Explain terms- Fouling and LMTD in relation to heat exchanger. 5
- (d) Discuss start-up heater controls with safety interlock. 5
- (e) Discuss instrumentation involved and technique used in process of milk pasteurization. 5

- 2 (a) Explain shrink and swell effect. How reduction in shrink and swell effect is achieved using three element drum level control. 10
- (b) How hot spot and cold spot formation is controlled in reactor. Draw and explain with control scheme. 10

- 3 (a) Draw process flow diagram of Iron and steel industry. Discuss instrumentation hardware involved in it. 10
- (b) Draw distillation tower and explain function of each part. Also discuss types of distillation. 10

- 4 (a) Draw crystallization curve. Discuss in which region crystallization process is carried out and why? 10
- (b) With PI & D explain cooling crystallizer with its control. 05
- (c) Discuss surge phenomenon in compressor. Draw and explain anti-surge control scheme. 05

- 5 (a) Explain the term Dryer. Draw and explain atmospheric tray dryer control scheme. 10
- (b) Define intrinsic safety. Discuss the techniques to reduce explosion hazard. 10

- 6 (a) Draw and explain selective control scheme of evaporator. 10
- (b) Draw and explain feed forward and bypass control scheme of heat exchanger. 10