



- N.B. :** (1) Question No. 1 is compulsory.  
(2) Attempt any four questions from rest six questions.  
(3) Assume suitable data wherever necessary.

1. Attempt any five :- 20
- (a) Explain the term "loop tuning".
  - (b) "Feedback control alone cannot be used for process control". - Justify the statement.
  - (c) Explain any one method used for PID tuning.
  - (d) Develop the mathematical model for 2-tank system connected in series.
  - (e) Justify the need of Adaptive Control.
  - (f) Differentiate between Batch and continuous process.
2. (a) Develop the ladder logic diagram for a simple Coffee-vending m/c. (Assume suitable data). 10
- (b) Explain the different languages available for PLC programming. Differentiate between modular and fixed PLC. 10
3. (a) State the dynamic response of 1st order lag process and a pure capacitive process. 10
- (b) Derive the mathematical model for CSTR. 10
4. (a) Describe the split range control with application. 10
- (b) Justify the need of over-ride control with application. 10
5. (a) Explain the "degree of freedom" concept with reference to process control. 10
- (b) Differentiate between the cascade and feedback control. 10
6. (a) Explain the terms P, I and D and justify their use in process control with application. 10
- (b) Explain the following terms with respect to process characteristics :- 10
- (i) Process equation
  - (ii) Process load
  - (iii) Disturbance
  - (iv) Process lag
7. (a) Discuss the issues in obtaining the process model. 10
- (b) Suggest the control scheme for controlling the temperature of the jacketed Batch reactor and justify the same. 10

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