

Total No. of Questions : 10]

SEAT No. :

P4515

[Total No. of Pages :2

**[4959]-1191**  
**B.E. (Instru.)**  
**PROCESS INSTRUMENTATION**  
**(2012 Pattern)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Neat diagram must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of Logarithmic tables. electronic pocket calculator and steam table is allowed.
- 5) Your answer will be valued as a whole.
- 6) Assume suitable data if necessary.

- Q1)** a) Explain Steady State gain. [5]  
b) Explain effect of integral controller on pure dead time system. [5]

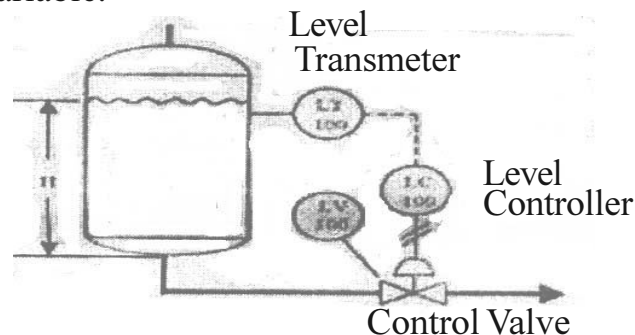
OR

- Q2)** a) List performance criteria for feedback control loop and explain any one. [6]  
b) Explain process time constant. [4]

- Q3)** a) Explain equipment specification. [6]  
b) Explain self regulating capacity with example. [4]

OR

- Q4)** a) Identify various process variable associated with process shown in figure below and classify them as controlled variable, manipulated variable, and load variable. [4]



- b) Discuss gas pressure control loop. [6]

**P.T.O.**

- Q5)** a) Explain ratio control with proper example. [9]  
b) Explain cascade control with proper example. [9]

OR

- Q6)** a) Explain implementation issues in feed-forward control. [9]  
b) Explain  
i) Dead Band [4]  
ii) Negative Resistance [5]

- Q7)** a) What is effect interaction on feedback control. [8]  
b) How multiloop performance can be improved by using loop paring. [8]

OR

- Q8)** a) What is relative gain array? How it can be used for analysis of interaction. [8]  
b) Calculate relative gain array matrix and choose suitable manipulated and controlled variable pair for a system who's gain matrix is given below.[8]

$$\begin{bmatrix} \frac{4}{s+1} & \frac{10}{(s+2)} \\ \frac{1}{2s+1} & \frac{2}{3s+4} \end{bmatrix}$$

- Q9)** a) Explain Process operability window. [8]  
b) Explain safety and equipment protection. [8]

OR

- Q10)**a) Explain control for safety [8]  
b) How control design method is integrated in designing of process control.[8]

