

Total No. of Questions : 8]

P3082

SEAT No. :   
[Total No. of Pages : 2

[5670]-183

B.E. (Electrical)

Control System - II

(2012 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer any one question from each pair of questions Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.

- Q1) a) Derive an expression of transfer function from its state space model. [8]  
b) A unity feedback system has an open loop transfer function, [12]

$$G(s) = \frac{4}{s(s+2)}$$
 Design a suitable Lead compensator so that phase margin is 50° and  $K_v = 20/\text{sec}$ .

OR

- Q2) a) Explain Kalman's methods of testing controllability and observability of control system. [8]  
b) Determine the STM for the system is given by : [12]

$$\dot{\mathbf{X}}(t) = \begin{bmatrix} -2 & 3 \\ 0 & -3 \end{bmatrix} \mathbf{X}(t)$$

by Laplace Inverse transform method.

- Q3) a) Classify various types of non linearities with their characteristics. [8]  
b) Explain Jump resonance and limit cycle for non-linear system. [10]

OR

- Q4) a) Derive the Describing function for Ideal Relay. [8]  
b) What do you mean by singular points? Sketch various singular points. [10]

- Q5) a) Explain Sampling and reconstruction process. [8]  
b) Derive transfer function of ZOH device. [8]

OR

- Q6) a) Explain important properties of Z-transform. [8]  
b) Find the z-transform of a unit step function sampled with time period of T seconds. [8]

- Q7) a) Explain PPI, PID controllers with their characteristics. [8]  
b) Describe Ziegler-Nichol method for PID controller. [8]

OR

- Q8) a) Define pulse transfer function. Explain general procedure of obtaining pulse transfer function. [8]  
b) Write a short note on Digital PID controller. [8]

[5670]-183

2

P.T.O.