

Total No. of Questions : 8]

SEAT No. :

P3082

[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]

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

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]

P.T.O.

- 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 P,PI, PID controllers with their characteristics. [8]
b) Describe Zigler-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]

