

Exam.Code:0935

Sub. Code: 33762

2125

B.E. (Electrical and Electronics Engineering)

Fifth Semester

PC-EE-502: Control Engineering - II

Time allowed: 3 Hours

Max. Marks: 50

*NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit. Assume any missing data.*

*x-x-x*

1. (a) Write purpose of sampler in digital control system.
- (b) Write applications of digital control systems.
- (c) What is quadrature wave damping?
- (d) Define and write significance of state transition matrix.
- (e) Differentiate between compensators and controllers. (5x2)

**UNIT - I**

2. (a) Discuss working of ON/OFF controller with significance of hysteresis.
- (b) What do you mean by tuning of controllers? Explain Cohn-Kuhn method. (5,5)
3. (a) Obtain phase variable representation of system whose transfer function is:

$$\frac{Y(s)}{U(s)} = \frac{6s^3 + 4s^2 + 3s + 10}{s^3 + 8s^2 + 4s + 20}$$

Also, draw signal flow graph.

- (b) Determine controllability and observability:

$$\frac{Y(s)}{U(s)} = \frac{2}{s^3 + 6s^2 + 11s + 6}$$

(5, 5)

4. Explain designing of lead compensator for control system using bode plot technique.  
What are the applications of this controller? (10)

P.T.O.

(2)

**UNIT - II**5. (a) Find z-transform of  $e^{-at} \sin \omega t$ 

(b) Explain ZOH circuit with proper waveforms. Also, derive transfer function for it.

(5,5)

6. Using Bilinear transformation, find stability:

$$2z^4 + 8z^3 + 12z^2 + 5z + 1 = 0$$

(10)

7. Explain working and operation of stepper motor and its various controls.

(10)

*x-x-x*