DEPT OF ECE , MCET

V SEM ECE 2018-19(I SEM) ASSIGNMENT 2 (ACS- UNIT IV & V)

UNIT: IV

1. Explain the block diagram of digital Control System
2. What are the merits & demerits of DCS over Analog control system
3. Derive Transfer function of Sampled data control system
4. Derive Transfer of Zero Order Hold (ZOH) circuit
5. Describe the concept of stability in Discrete control system
6. Explain Jury test for stability
7. Test Stability of DCS , using Jury test for the given characteristic equation
   f(z)= $z^4 + 5z^3 + 0.5z^2 + 7z + 0.3 = 0$
8. Test Stability of DCS , using RH criterion for the given characteristic equation
   f(z)= $2s^4 + 5s^3 + 0.5s^2 + 7s + 1.9 = 0$

UNIT: V

1. Obtain the State- space representation of the following system described by differential equation: $\frac{d^3y}{dt^3} + 3\frac{d^2y}{dt^2} + 4\frac{dy}{dx} + 4y = u_1 + 3u_2 + 4u_3$

   Output equations: $y_1 = 4\frac{dy}{dx} + 3u_1$ $y_2 = \frac{d^2y}{dt^2} + 4u_2 + u_3$

2. Obtain the state space model of the given transfer function

$$\frac{C(s)}{U(s)} = \frac{10(s+2)}{s^3+3s^2+5s+15}$$

3. Define State Transition Matrix and give any five properties

4. Compute STM when A= $\begin{bmatrix} -1 & 1 \\ 0 & 2 \end{bmatrix}$

5. Define: Controllability and Observability of a system

6. Discuss the state controllability and observability of the following system

$$\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \end{bmatrix} = \begin{bmatrix} -3 & 1 \\ -2 & 1.5 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 1 \\ 4 \end{bmatrix} u$$

$$Y = \begin{bmatrix} 2 & 1 \\ 0 & -1 \end{bmatrix} \begin{bmatrix} X1 \\ X2 \end{bmatrix}$$

LAST DATE FOR SUBMISSION: 10/10/2018