PVP 12

Code: **EEPC2T5A**

I M.Tech - II Semester-Regular Examinations – AUGUST 2016

DIGITAL CONTROL SYSTEMS
(POWER SYSTEM CONTROL AND AUTOMATION)

Duration: 3 hours Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

1)

a) Explain sampling theorem. 7 M

b) Obtain the frequency response characteristics of Zero order hold device. 7 M

2)

a) State and prove Final value theorem. 7 M

b) 7 M

i) Find Z-transform of $t\, e^{-at}$

ii) Find Inverse Z-transform of $\frac{1}{(Z-1)}$

3)

a) What is Bi-linear transformation. 7 M

b) Find stability if $F(Z) = Z^3-1.25Z^2-1.375Z-0.25=0$. 7 M

4) Determine the steady state error due to 14 M
   i) Ramp function and
   ii) Parabolic function
   inputs of a discrete time system.

5)
   a) State the properties of State Transition Matrix. 7 M

   b) Obtain the solution to the discrete time state space equations. 7 M

6)
   a) Explain the principle of Duality. 7 M

   b) Determine the controllability of the system if, 7 M

$$A=\begin{bmatrix} 0 & 1 \\ -0.25 & 1 \end{bmatrix}; \qquad B=\begin{bmatrix} 1 \\ 0.5 \end{bmatrix}$$

7) Explain the procedure to design a Minimum order state observer. 14 M

8)
   a) Develop the block diagram of a Microprocessor based control system. 7 M

   b) Write a short notes on effect of finite word length on the closed loop pole placement. 7 M