

Code: EEPC2T5A

I M.Tech - II Semester-Regular Examinations – September 2015

DIGITAL CONTROL SYSTEMS
(POWER SYSTEM CONTROL AND AUTOMATION)

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) What are the advantages of Digital Control. 7 M
b) Determine the transfer function of First order hold device. 7 M
2. a) State and prove complex translation theorem. 7 M
b) i) Find Z-transfer of $\sin \omega t$.
ii) Find Inv-Z-transfer of $Z^{-2}(1-Z^{-1})(Z^{-1} + 1)$. 7 M
3. a) What are the properties of Z-plane. 7 M
b) Find the stability if characteristic equation is $z^3 + 3.3z^2 + 4z + 0.8 = 0$ by Jury Stability test. 7 M
4. Explain the correlation between time response and root locations. 14 M

5. a) Derive an expression to obtain the state transition matrix of a Discrete time system. 7 M
- b) Obtain the solution to the Discrete State Equation using Z- transform method. 7 M
6. a) Explain Dead Beat response. 7 M
- b) Determine the controllability of the system, if 7 M
- $$A = \begin{bmatrix} 1 & -2 \\ 1 & -1 \end{bmatrix}; \quad B = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}.$$
7. Explain the procedure to design a Full order state observer. 14 M
8. Explain the architecture and features of TMS 320 Digital Signal Processor. 14 M