



Code No: A5405

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.Tech I Semester Examinations October/November-2011

DIGITAL CONTROL SYSTEMS

(POWER ELECTRONICS AND ELECTRIC DRIVES)

Time: 3hours

Max.Marks:60

Answer any five questions

All questions carry equal marks

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- 1.a) Draw the Block Diagram of typical Digital Control Systems and describe each block
- b) Write the advantages of sampling in Digital Control Systems. [12]
- 2.a) Write the merits & demerits of Analog and Digital control systems.
- b) What are the advantages of Signal flow graphs in Digital Control Systems? [12]
- 3.a) Derive state transition equation of digital time in-variant systems.
- b) How to find the stability using 2nd method Lyapunov. [12]
4. Elaborate steady state error analysis in Digital Control Systems. [12]
5. Define phase margin and gain margin, how to calculate them from Nyquist plot and Bode Plot with example. [12]
- 6.a) Explain the theorems on controllability and observability.
- b) Write the relation between controllability, observability and Transfer function. [12]
7. Explain and give the design procedure of full order state observer and reduced state observer. [12]
8. Write the short notes on the following.
 - a) Discrete maximum principle
 - b) Peak time of transient response
 - c) Pulse Transfer Function. [12]

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