

Code :R5321001

R5

III B.Tech II Semester(R05) Supplementary Examinations, April/May 2011
AUTOMATION OF INDUSTRIAL PROCESSES
(Electronics & Instrumentation Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

1. (a) Discuss about the basic elements of computer controlled process.
 (b) List out the various steps involved in design of digital computer control loops.
2. (a) Discuss the functional requirements of a Distributed Process Control.
 (b) 'Communication' plays a Critical role in DCS. Discuss.
3. (a) Given the digital control system
 $U(K+1) = A X(K) + B U(K)$
 $C(K) = D X(K)$
 Prove that if pair $[A, D]$ is observable, then the closed loop realized by output feed back
 $U(K) = -G C(K) + r(K)$ is also observable.
 (b) Describe the relationship among controllability, observability and transfer function.
4. (a) What are the limitations of Z transforms? Define modified Z transform and obtain modified Z transform for $G(S) = 1/(S+1)$
 (b) Write a short notes on Zero order Hold (ZOH) device. Also derive its transfer function.
5. Design dynamic feed forward controller for the system with
 $G_p(Z^{-1}) = \frac{(4-Z^{-1})}{(2-Z^{-1})(3-Z^{-1})}$ and $G_v(Z^{-1}) = \frac{Z^{-1}}{(1.5-Z^{-1})(4-Z^{-1})}$.
6. With a block diagram explain the Model Reference Adaptive control System.
7. What are different types of artificial intelligent systems? Explain each of them.
8. Write short notes on the following:
 - (a) Programmable logic controllers (PLCs)
 - (b) Data Highway.
