EI - 802

B.E. VIII Semester

Examination, June 2015

Digital Control Systems

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt one question from each unit.
ii) All question carry equal marks.

Unit - I

1. a) With the help of Block diagram explain digital control system.
   b) Discuss the uses of A/D , D/A an ZOH elements.

OR

2. a) State and prove sampling theorem. What is Nyquist frequency?
   b) How is a discrete LTI system characterized by difference equations?

Unit - II

3. a) How is the mapping between s-plane and z-plane done?
   b) Determine the response of the system for unit impulse response. Using z - transform.
   $y(n) = x(n) + 2x\,(n-2) + x(n-4)$.

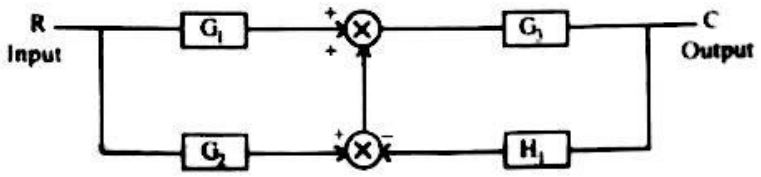
OR

4. a) Find inverse Z-Transform of the following:

   (i) $X(z) = \dfrac{Z}{(Z-1)(Z-2)}, |Z| > 2$

   (ii) $X(z) = \dfrac{Z^3}{(Z-1)^3}, |Z| > 1$

   b) From the block diagram of fig. 1 draw the corresponding signal flow graph and evaluate closed loop transfer function.



Unit - III

5. Discuss about the stability study using Routh's test and jury's test.

OR

6. Discuss the root locus analysis for stability of discrete control system.

Unit - IV

7. a) Discuss the Aliasing in discrete transform analysis.
   b) Discuss about the pseudo continuous time control system.

OR

8. a) Discuss about Transformation methods between planes s, z and w.
   b) Discuss briefly about Jordan Transformation.

Unit - V

9. a) Discuss about the state variable representation of a discrete time SISO system using canonical variables.
   b) Discuss the state variable representation in the z-domain.

OR

10. a) Discuss about the state variable representation of a discrete time SISO system using physical variables.
    b) Discuss about system stability and Time response between sampling instants.

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