

Total No. of Questions : 6]

SEAT No. :

P218

Oct./BE/Insem.-534

[Total No. of Pages : 2

B.E. (Electrical)

CONTROL SYSTEM - II

(2015 Pattern) (Semester - I)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) *Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.*
- 2) *Draw Neat diagram wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) a) With a neat block diagram, explain in detail Analog to Digital Conversion process. **[6]**

b) What is ZOH? Derive its transfer function. **[4]**

OR

Q2) a) State Shannon's Sampling theorem and explain the concept of aliasing. **[6]**

b) With a neat block diagram, explain the configuration of basic digital control system. **[4]**

Q3) a) Solve following difference equation using Z-transform. **[6]**

$$y(k+2) + 4y(k+1) + 3y(k) = 2^k$$

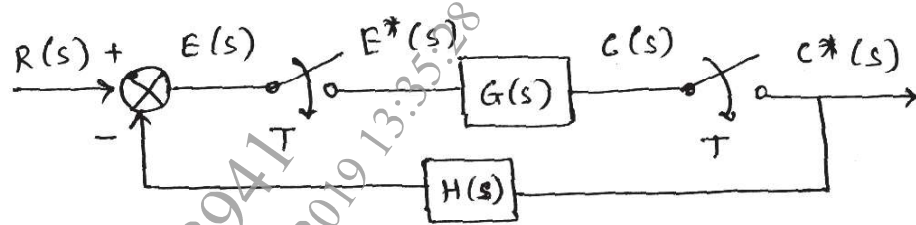
Given that $y(0) = y(1) = 0$

b) Obtain $X(Z)$ if $x(k) = k(-2)^k$ **[4]**

OR

P.T.O.

- Q4) a)** Obtain the closed loop pulse transfer function $C(z)/R(z)$ for the following system. [6]



- b) Obtain inverse Z-transform by long division method, if $F(z)$ is non-casual and given as $F(Z) = \frac{1}{\frac{1}{4}z^{-2} - \frac{2}{4}z^{-1} + 1}$. Obtain 3 terms in the quotient and write sequence $f(k)$. [4]

- Q5) a)** Apply Jury Stability Test and comment on stability of the discrete time system described by the characteristic equation $z^3 - 1.4z^2 + 0.53z - 0.04 = 0$. [6]

- b) Using parallel digital programming technique, obtain block diagram for the system with Z transfer function $D(Z) = \frac{z^2 + z - 2}{z^2 + 4z + 3}$. [4]

OR

- Q6) a)** Using cascade digital programming technique, obtain block diagram for the system with Z transfer function $D(Z) = \frac{(z-1)(z^2+z+2)}{z^3+3z^2+5z+3}$. [6]

- b) Write a short note on mapping of s-plane into z-plane. [4]

