ASSIGNMENT-2

1.

Consider the impulse sampler and the 1st order hold shown in figure. Derive the transfer function of the 1st order hold, assuming a unit ramp function as the input x(t) to the sampler.

2. Obtain the Z-transform of

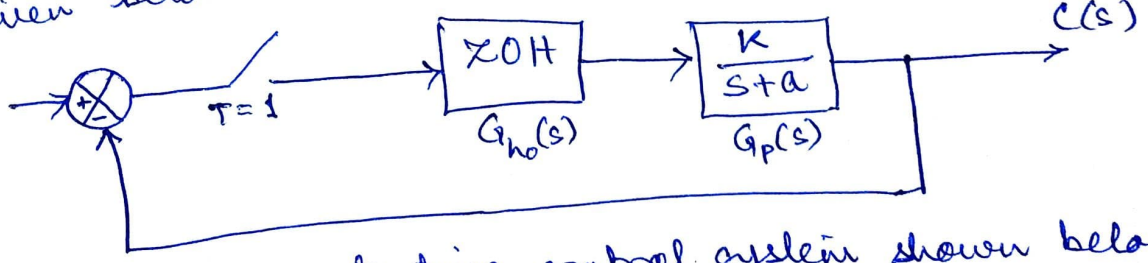
$$X(s) = \frac{1-e^{-Ts}}{s} \cdot \frac{1}{(s+a)^2}$$

3. Obtain the weighting sequence g(k) of the system described by the difference equation

$$y(k) - ay(k-1) = x(1) \qquad -1 < a < 1$$

If two systems described by this equation are connected in series, what is the weighting sequence of the resultant system?

4. Obtain the closed-loop pulse transfer function of the system given below.



5. Consider the discrete-time control system shown below. Determine the range of K for stability using (i) Jury's stability Criterion and (ii) Bilinear Transformation coupled with R-H criterion