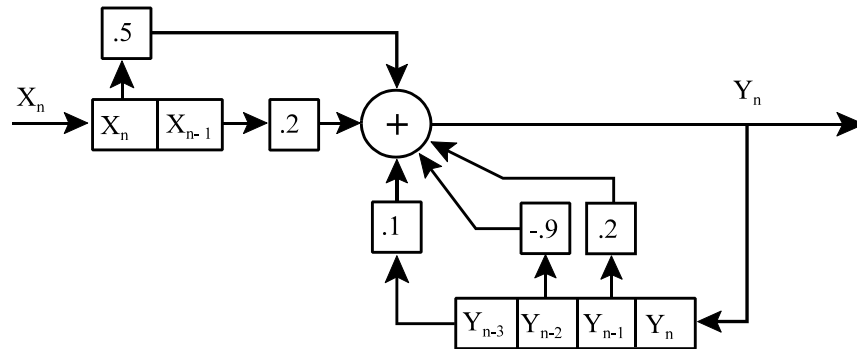


EE 432-1, Digital Control Systems, HW-2

Dr. Ahmad A. Masoud, Date Posted: Monday October. 1st 2007, Date Due: Saturday Oct. 20 2007.

Q1-



For the system with the above simulation diagram:

- 1- draw the SFG of the system and use Mason's formula to compute the transfer function,
- 2- write the discrete state space equations of the system,
- 3- use the state equation to derive the system's transfer function,
- 4- assume that initially the output register is storing $[y_{-3} \ y_{-2} \ y_{-1} \ y_0] = [1 \ 0 \ 1 \ 1]$ and there is no input signal. Use the eigenvalue decomposition approach to find the contents of the registers at $n=100$,
- 5- if in step 4 a discrete impulse is used for an input, what is the output at $n=100$,
- 6- starting from the difference equation of the system use the Z-transform approach to compute the output in 5.