1-a) X(z) =

Y(z) =

Transfer function

1-b) function Interrupt:

I = READ (ADC)

A = I + 0.5 B + 0.25 C

Y = 0.25 B + C

OUTPUT(Y)

C=B

B=A

RETURN

2) Response of the system is shown as blue in these figures.

For f= 1 Hz



num = [1];

denum=[1, 2, 1];

transfer\_func = tf(num, denum);

Fs = 1000; % sampling frequency

t=(0:Fs-1)/Fs;

f=1; % cos function frequency

y=1.6\*cos(2\*pi\*f\*t);

lsim(transfer\_func,y,t);

For f=10^-2 Hz



num = [1];

denum=[1,2,1];

transfer\_func = tf(num, denum);

Fs = 1000; % sampling frequency

t=(0:Fs-1)/Fs;

f=10^-2; % cos function frequency

y=1.6\*cos(2\*pi\*f\*t);

lsim(transfer\_func,y,t);