**%% Experiment No. 2B**

**%% BILINEAR TRANSFORMATION**

clc;

sp=0.25\*pi;

wp=(2\*tan(sp/2));

ss=0.55\*pi;

ws=(2\*tan(ss/2));

rp=0.5;

rs=15;fs=1;

s=0.1\*rs;e2=(10^s)-1;

v=0.1\*rp;e3=(10^v)-1;

k=ws/wp;

N=log10(e2/e3)/(2\*log10(k))

N=ceil(N)

[z,p,k]=buttap(N)

[num,den]=zp2tf(z,p,k)

[bz,az]=bilinear(num,den,fs)

**OUTPUT**

N = 2.6587

N = 3

z = []

p = -0.5000 + 0.8660i

 -0.5000 - 0.8660i

 -1.0000

k = 1.0000

num = 0 0 0 1.0000

den = 1.0000 2.0000 2.0000 1.0000

bz = 0.0476 0.1429 0.1429 0.0476

az = 1.0000 -1.1905 0.7143 -0.1429

**%% Experiment No. 2A**

**%% IMPULSE INVARIENT METHOD**

clc;

clear all;

close all;

wp=0.25\*pi;

ws=0.55\*pi;

Rp=0.5;

Rs=15;

s=0.1\*Rs; e2=(10^s)-1;

v=0.1\*Rp; e3=(10^v)-1;

k=ws/wp;

N=log10(e2/e3)/(2\*log10(k));

N=ceil(N)

[z,p,k]=buttap(N)

[num,den]=zp2tf(z,p,k)

[bz,az]=impinvar(num,den)

**OUTPUT**

N = 4

z = []

p = -0.3827 + 0.9239i

 -0.3827 - 0.9239i

 -0.9239 + 0.3827i

 -0.9239 - 0.3827i

k = 1

num = 0 0 0 0 1

den = 1.0000 2.6131 3.4142 2.6131 1.0000

bz = 0.0000 0.0828 0.1657 0.0226 0

az = 1.0000 -1.5587 1.2283 -0.4722 0.0733