Tribhuvan University

Institute of Engineering

Pulchowk Campus

Lab Report on :

LTI SYSTEM

Submitted By:

Saugat Kafley (075BCT099)

Submitted To:

Ganesh Gautam

Department of Electronics and Computer Engineering

Submission Date:

August 24 , 2022

DSAP Lab4 LTI systems

a) Transfer function to z-plane
num = [1 0.23 0.65 1.37 1];
den = [1 0 -1 0.77 1.65];

Code:

```
pkg load signal;
clc;
num = [1 0.23 0.65 1.37 1];
den = [1 0 -1 0.77 1.65];

%freqz(num , den)
[zeros , poles, k] = tf2zp(num , den)
zplane(zeros , poles)
```

Output:

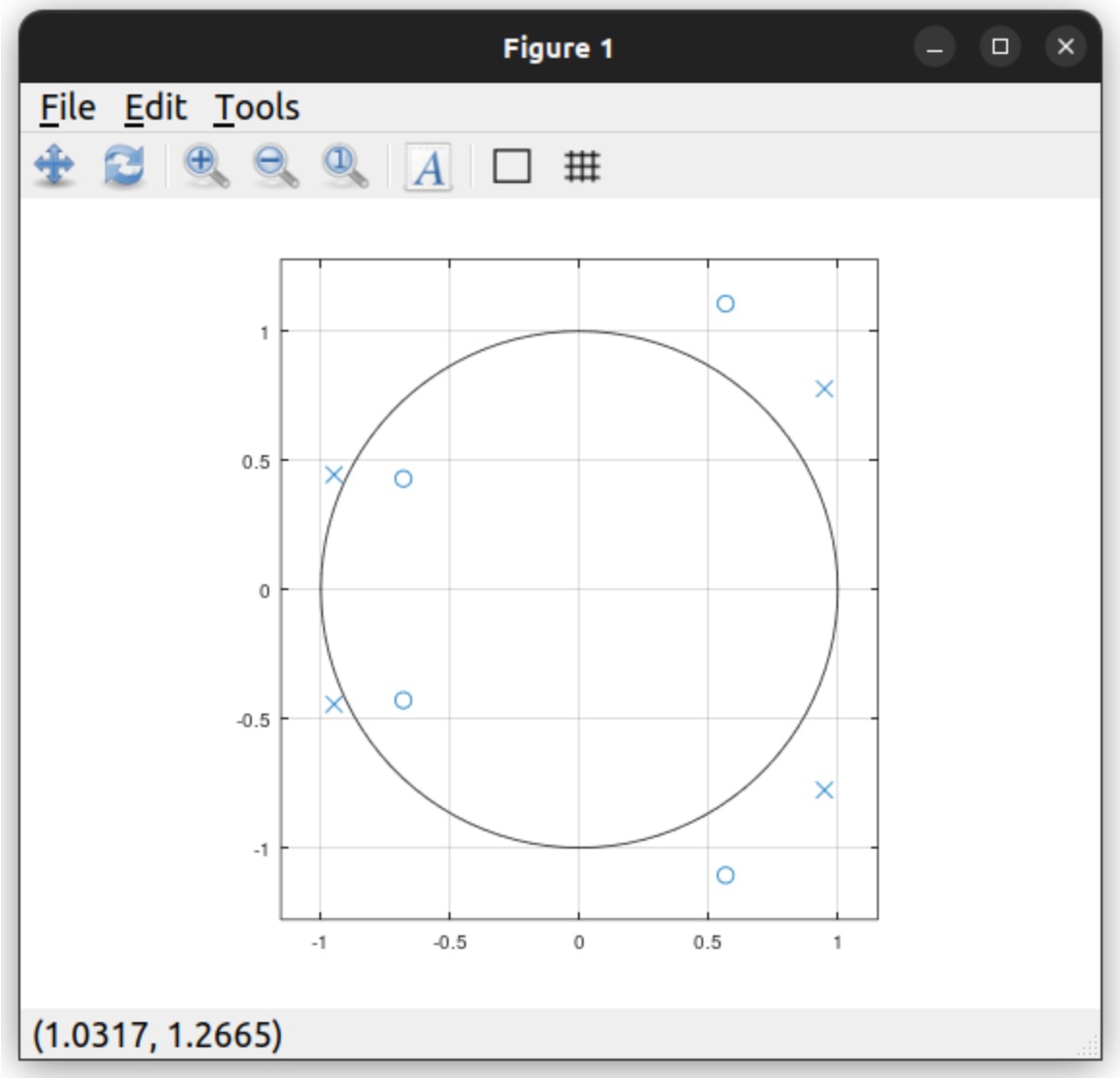
```
zeros =

   0.5660 + 1.1062i
   0.5660 - 1.1062i
  -0.6810 + 0.4288i
  -0.6810 - 0.4288i

poles =

   0.9488 + 0.7766i
   0.9488 - 0.7766i
  -0.9488 + 0.4442i
  -0.9488 - 0.4442i

k = 1
```



b) Zeros , poles and Gain are given as

z = [0.5660 + 1.1062i 0.5660 - 1.1062i -0.6810 + 0.4288i -0.6810 - 0.4288i];

p = [0.9488 + 0.7766i 0.9488 - 0.7766i -0.9488 + 0.4442i -0.9488 - 0.4442i] ;

k = [1];

Map to Transfer function:

Code:

```
pkg load signal;

z = [0.5660 + 1.1062i 0.5660 - 1.1062i -0.6810 + 0.4288i -0.6810 - 0.4288i ];

p = [0.9488 + 0.7766i 0.9488 - 0.7766i -0.9488 + 0.4442i -0.9488 - 0.4442i ] ;

k = [1];

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

zplane(num , den);

Output:

num =

1.0000 0.2300 0.6499 1.3699 1.0000

den =

1.0000 0 -1.0000 0.7700 1.6500