

Scilab Manual for
Principles of Control System
by Prof Mrugendra Vasmatkar
Others
VESIT¹

Solutions provided by
Ajinkya Khair
Others
V.E.S.I.T.

November 21, 2024

¹Funded by a grant from the National Mission on Education through ICT, <http://spoken-tutorial.org/NMEICT-Intro>. This Scilab Manual and Scilab codes written in it can be downloaded from the "Migrated Labs" section at the website <http://scilab.in>

Contents

List of Scilab Solutions	3
1 To analyse pole zero plot of a system	4
2 To find the characteristics equation and poles of a system	5
3 To find the gain equation of a system from given poles and zeros	6

List of Experiments

Solution 1.1	pole zero plot for a given system	4
Solution 2.1	characteristic equation and poles of system	5
Solution 3.1	gain equation of a system	6

Experiment: 1

To analyse pole zero plot of a system

Scilab code Solution 1.1 pole zero plot for a given system

```
1  clc;
2  close;
3  //Scilab 5.5.0;64 bit (windows 7)
4  //laplace//
5  //pole zero plot for  $g(s)=(s^2+3s+2)/(s^2+7s+12)$ 
6  s=%s;
7  p=poly([2 3 1], 's', "coeff")
8  q=poly([12 7 1], 's', "coeff")
9  V=syslin('c',p,q)
10 plzr(V)
11 syms s t ;
12 v =ilaplace('(2+(3*s)+s^2)/(s^2+(7*s)+12)',s,t)
13 disp(v,"V(t)=')
```

Experiment: 2

To find the characteristics equation and poles of a system

Scilab code Solution 2.1 characteristic equation and poles of system

```
1 clc;
2 close;
3 //Scilab 5.5.0;64 bit(windows 7)
4 //characteristic equation and poles of system
5 s=%s;
6 G=syslin('c',(5*(s+2))/((s+3)*(s+4)));
7 disp(G,"G(s)=")
8 x=denom(G);
9 disp(x,"Characteristics Equation=")
10 y=roots(x);
11 disp(y,"Poles of a system=")
```

Experiment: 3

To find the gain equation of a system from given poles and zeros

Scilab code Solution 3.1 gain equation of a system

```
1 clc;
2 close;
3 //Scilab 5.5.0;64 bit(windows 7)
4 //to find gain of a system from poles and zeros
5 printf("Given:Poles are s=-1,(-2+i),(-2-i); zeros s
    =-3+i,-3-i,Gain factor(k)=5 \n")
6 num=poly([-3+%i,-3-%i], 's', 'roots');
7 den=poly([-1,-2+%i,-2-%i], 's', 'roots');
8 G=(5*num)/den;
9 disp(G,"G(s)=")
```
