

Scilab Manual for
ELECTRONICS DESIGN AUTOMATION
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Solutions provided by
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Experiment: 1

Generate and plot various signals like sine square, pulse in same window

Scilab code Solution 1.1 1

```
1 clear; clc;
2 //Scilab 5.5.2, Ubuntu 16.04 LTS
3 //Generate and plot various signals like pulse,
  square, sine in same window
4 t=[1:240]; //x axis
5 y=[zeros(1,100), ones(1,40), zeros(1,100)] // y-axis
6 subplot(311) //figure divided to 3 plots
7 plot2d(t,y,rect=[1,0,220,2])
8 xlabel('time')
9 ylabel('Amplitude')
10 title('Square Pulse')
11 t=(0:0.1:6*pi)';
12 subplot(312)
13 plot2d(t,squarewave(t));
14 xlabel('time')
```

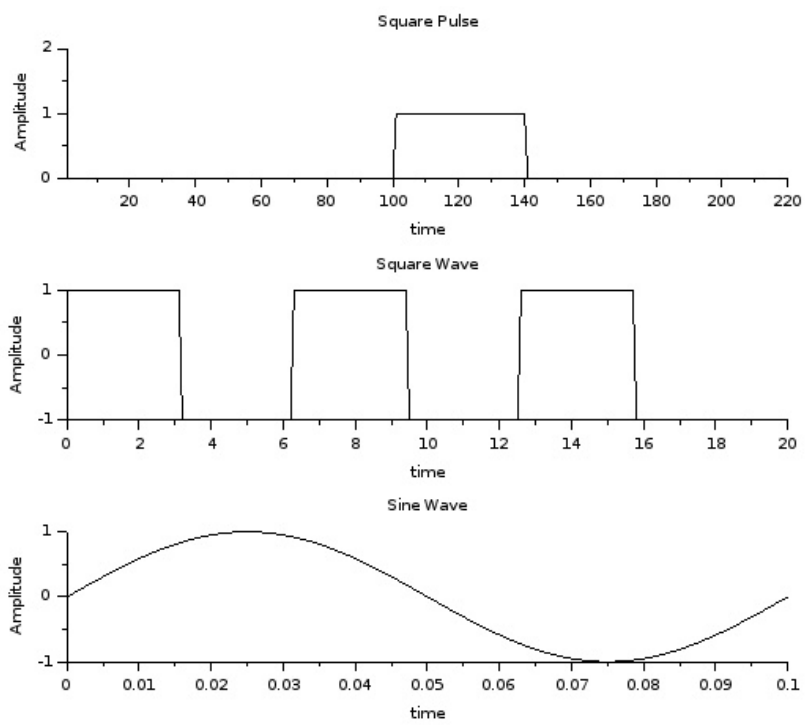


Figure 1.1: 1

```
15 ylabel('Amplitude')
16 title('Square Wave')
17 Fs=8000;
18 t=[0:0.1*Fs]/Fs;
19 y1=sin(2*pi*10*t);
20 subplot(313);
21 plot2d(t,y1);
22 xlabel('time')
23 ylabel('Amplitude')
24 title('Sine Wave')
```

Experiment: 2

Plot the diode/transistor characteristics

Scilab code Solution 2.2 2

```
1 clear; clc;
2 //Scilab 5.5.2, Ubuntu 16.04 LTS
3 //Plot the diode/transistor characteristics
4 Io = 2e-8; //Reverse saturation current
5 Id = [0:0.1:5]' * 10^(-3);
6 Vd = 0.052*log(Id/Io + 1); //Diode equation
7 plot2d(Vd, Id*10^3)
8 xlabel('Vd(V)');
9 ylabel('Id (mA)')
10 title('Diode Characteristics')
```

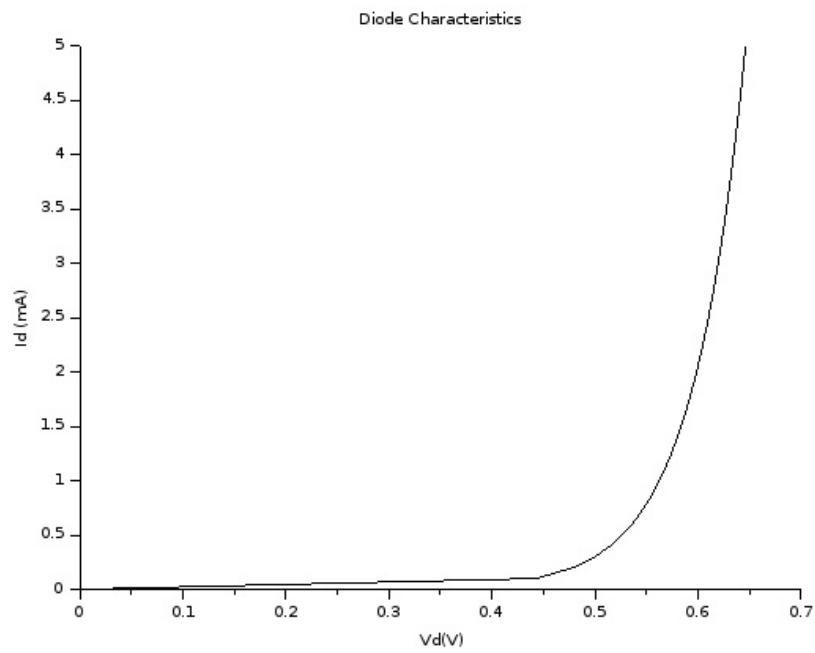


Figure 2.1: 2

Experiment: 3

Find the poles and zeros hence plot the transfer functions/polynomials

Scilab code Solution 3.3 3

```
1 clear; clc;
2 //Scilab 5.5.2, Ubuntu 16.04 LTS
3 //Find the poles and zeros hence plot the transfer
  functions/polynomials
4 s=poly(0, 's');
5 h=1/real((s+2*pi*(15+100*i))*(s+2*pi*(15-100*i)))
  );//Transfer function
6
7 //h=(1+2*s+5*s^2)/poly(1:3, 's', 'coeff')//
  another example
8 h=syslin('c',h);//continuous system
9 bode(h,10,1000,.01);//bode plot
10
11 figure();//new figure window
12
```

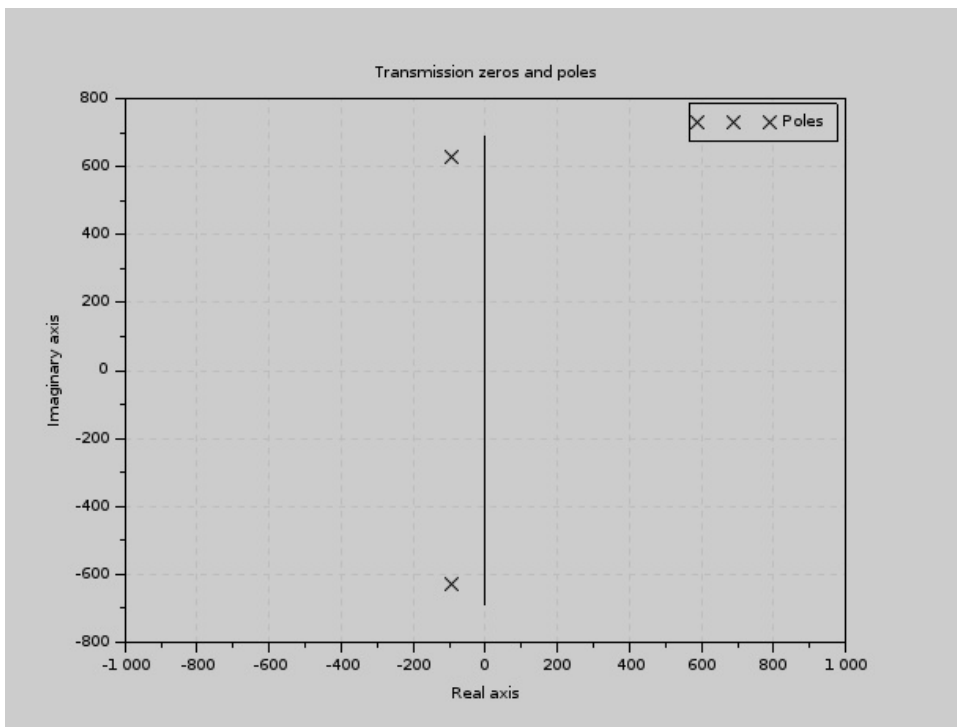


Figure 3.1: 3

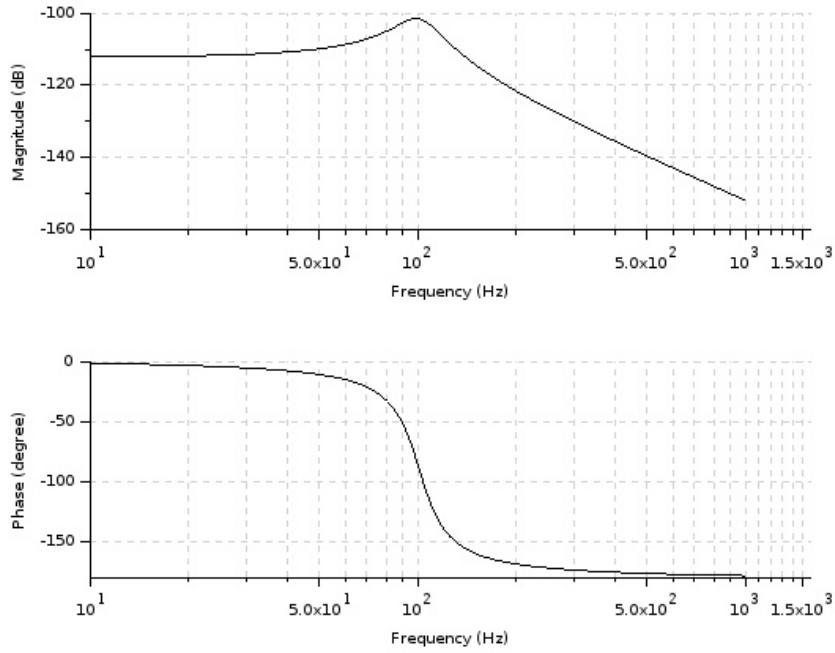


Figure 3.2: 3

13 `plzr(h); //pole zero plot`

Experiment: 4

Plot a full wave rectified waveform using Fourier series

Scilab code Solution 4.4 4

```
1 clear; clc;
2 //Scilab 5.5.2, Ubuntu 16.04 LTS
3 //Plot a full wave rectified waveform using Fourier
  series
4 dt=0.05;A=5;w0=1;//Amplitude=5V
5 t=20.0/dt +1;//no. of points on x-axis
6 //regeneration from Fourier coefficients of FWR
  signal
7 for n=-10:10
8     for m=1:t
9         sig1(n+11,m)=((2*A/(%pi*(1-4*n^2)))*exp(-1*
                %i*n*w0*dt*(m-1)));
10    end
11 end
12 for m=1:t
13     sig2=sig1(:,m);
14     sig3(m)=sum(sig2);
```

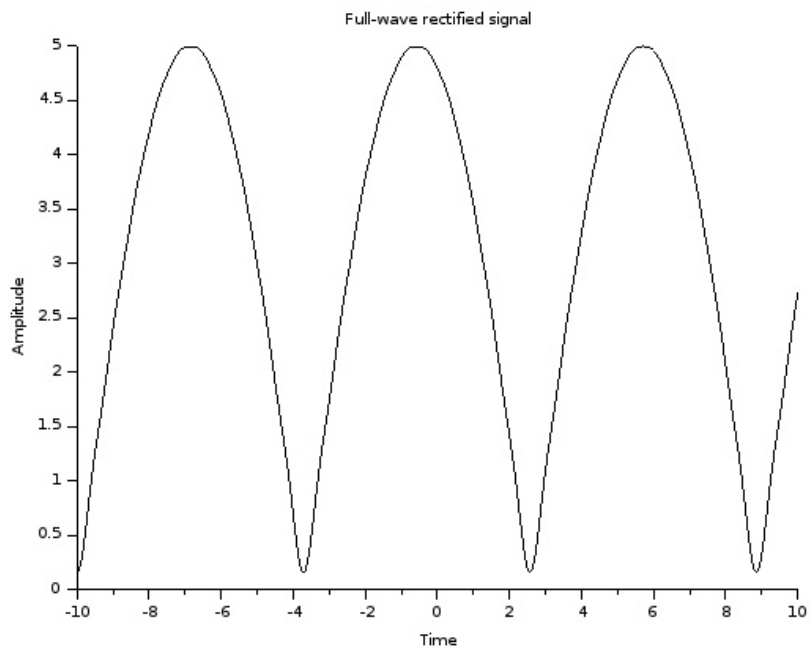


Figure 4.1: 4

```
15 end
16 sig=sig3';
17 t=-10:0.05:10.0; // x-axis defined
18 plot2d(t,sig)
19 xlabel('Time')
20 ylabel('Amplitude')
21 title('Full-wave rectified signal')
```
