Analog Communication Laboratory Report

Subject Code: EC 591

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Statement:

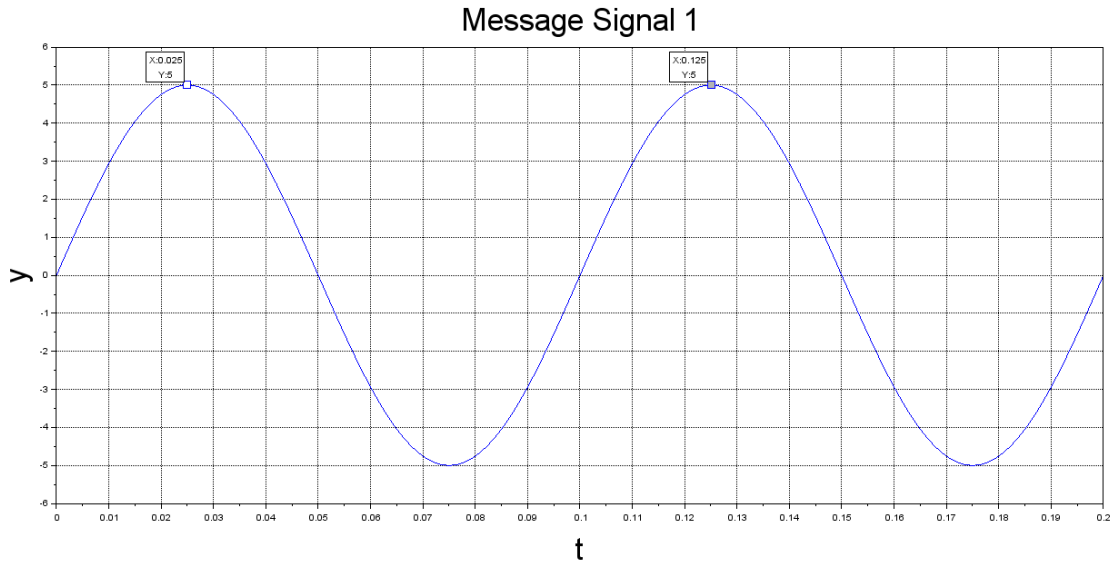
Write a program for TDM of multiple signals.
Take at least two different signals (may be more)
Try also the Demultiplexing

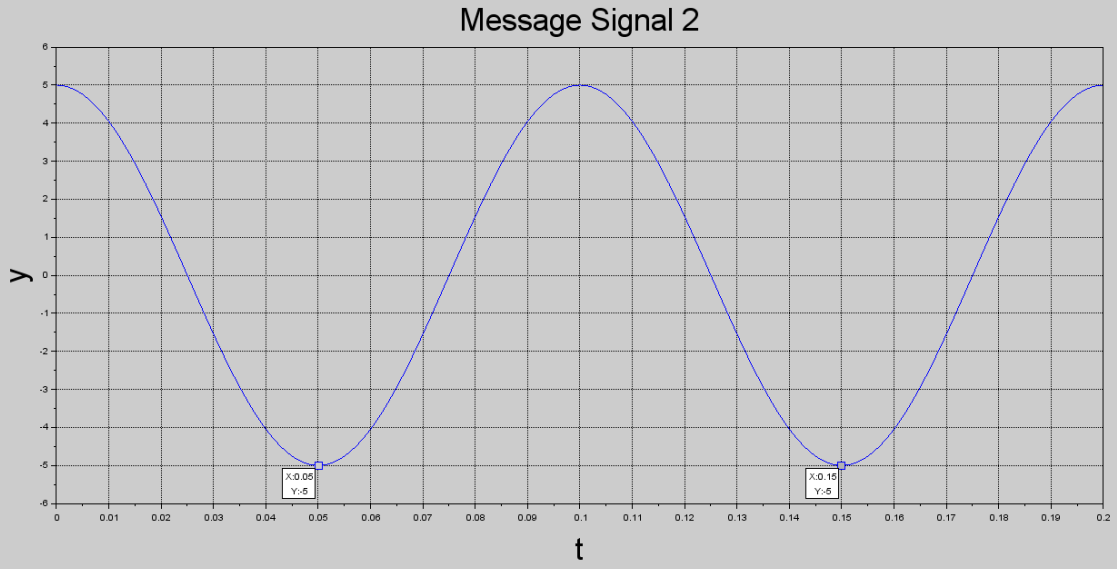
SCILAB Program code:

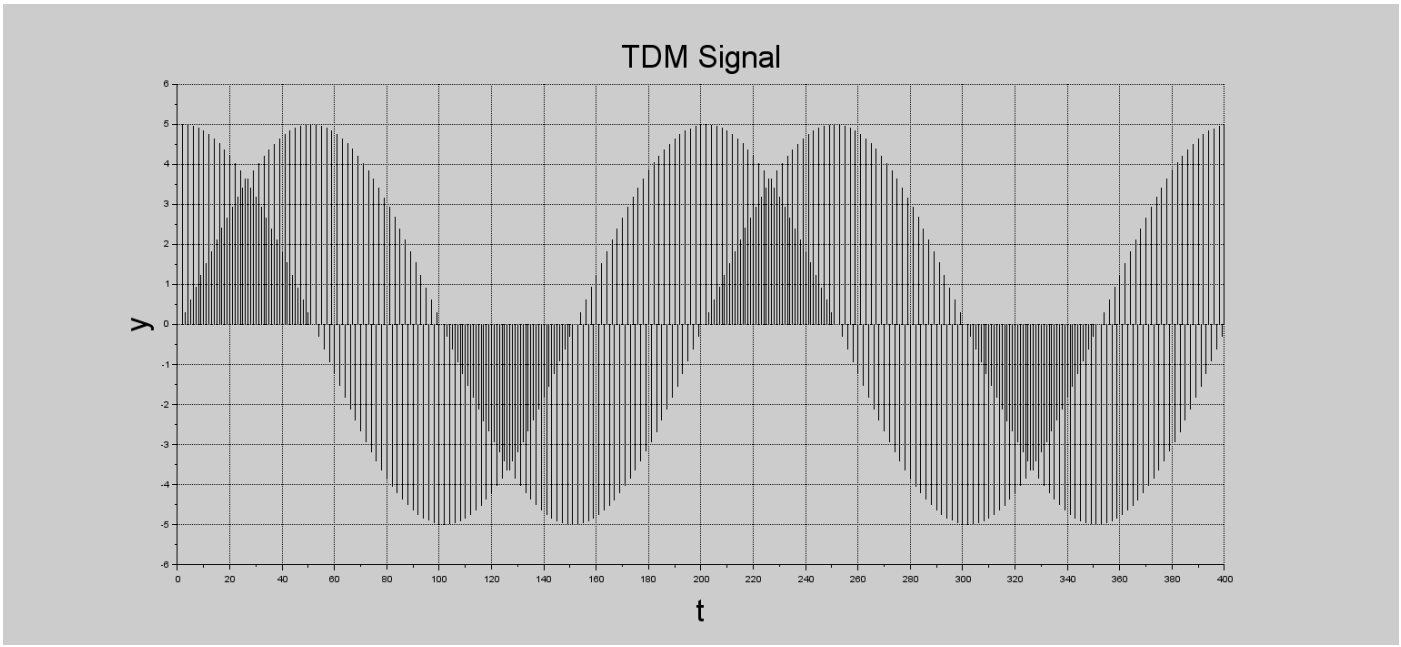
```
clc;
clf;
clear all;

freq_msg = 10;
amp_msg = 5;
fs = 100 * freq_msg;
t = 0:1/fs:2/freq_msg;

msg_sig_1 = amp_msg * sin(2*%pi*freq_msg*t);
msg_sig_2 = amp_msg * cos(2*%pi*freq_msg*t);

plot(t, msg_sig_1)
title("Message Signal 1","Fontsize",6);
xlabel("t","Fontsize",6);
ylabel("y","Fontsize",6);
xgrid()

figure()
plot(t, msg_sig_2)
title("Message Signal 2","Fontsize",6);
xlabel("t","Fontsize",6);
ylabel("y","Fontsize",6);
xgrid()
```

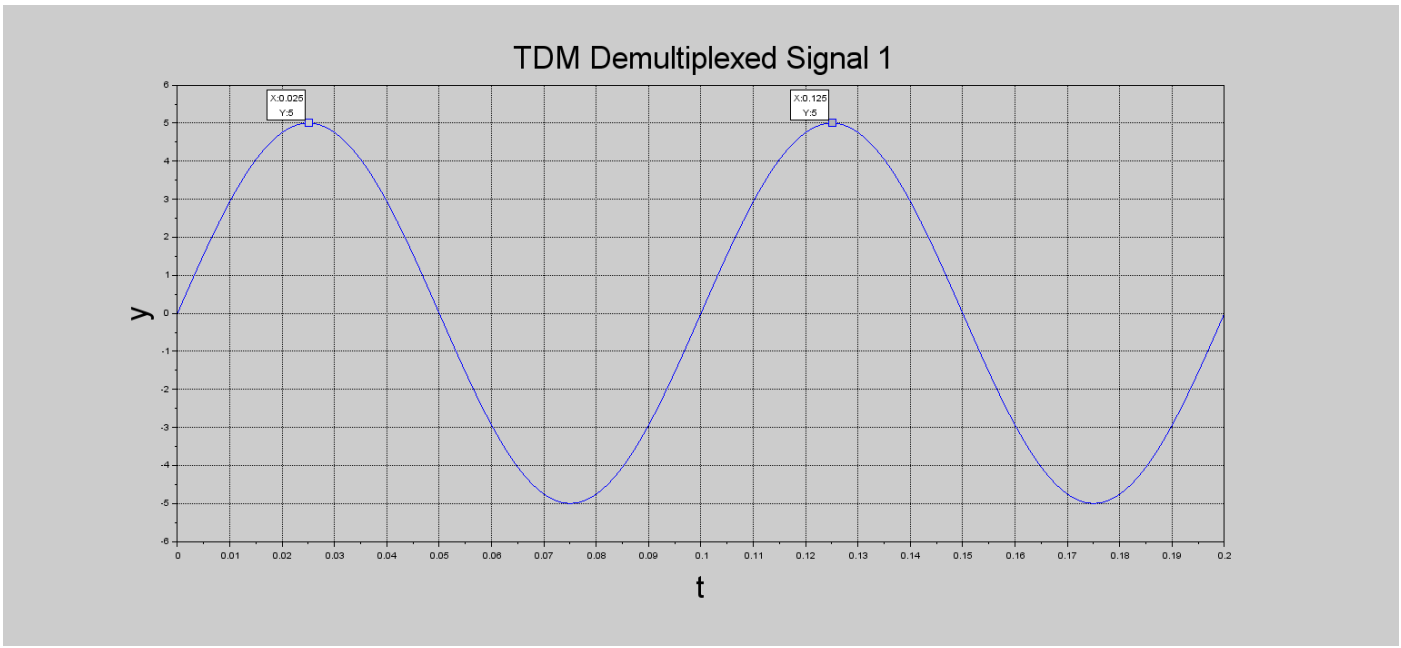
```
// tdm signal generation
tdm =0;
j=1

for i = 1: 2 : 2 * length (t)

 tdm (i)= msg_sig_1 (j);
 i=i+1;
 tdm (i)= msg_sig_2 (j);
 j=j+1;

end

figure()
plot2d3(tdm)
title("TDM Signal","Fontsize",6);
xlabel("t","Fontsize",6);
ylabel("y","Fontsize",6);
xgrid()

//demultiplexing the TDM

n = 1
for l = 1:1:length(t)
   sig_1_re(l) = tdm(n)
   n = n + 1;
   sig_2_re(l) = tdm(n)
   n = n + 1;

end

//plotting the demultiplexed signals

figure();
plot(t, sig_1_re)
title("TDM Demultiplexed Signal 1","Fontsize",6);
xlabel("t","Fontsize",6);
ylabel("y","Fontsize",6);
xgrid()

figure();
plot(t, sig_2_re)
title("TDM Demultiplexed Signal 2","Fontsize",6);
xlabel("t","Fontsize",6);
ylabel("y","Fontsize",6);
xgrid()
```

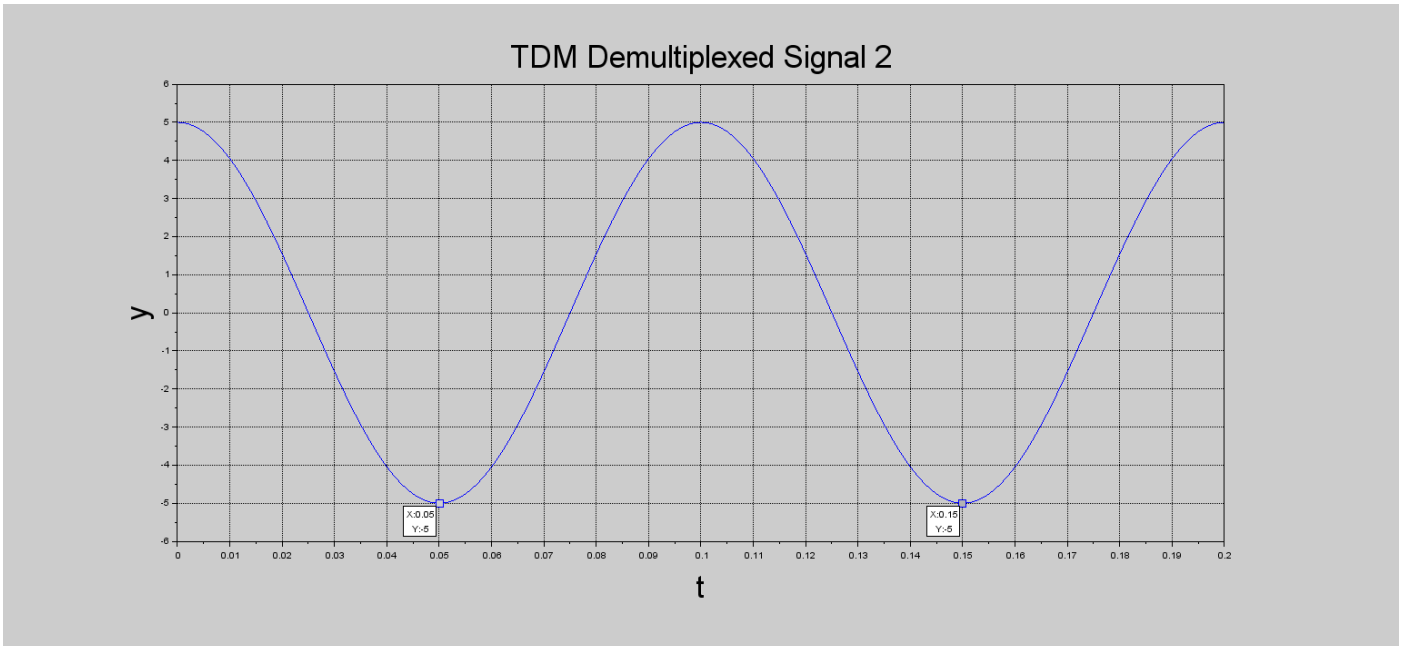
Graphs:


Message Signal 1
X:0.025
Y:5
X:0.125
Y:5
y
t


Message Signal 2
X:0.05
Y:-5
X:0.15
Y:-5
y
t


TDM Signal
y
t


TDM Demultiplexed Signal 1
X:0.025
Y:5
X:0.125
Y:5
y
t


TDM Demultiplexed Signal 2
X:0.05
Y:-5
X:0.15
Y:-5
y
t

Measurements:

Time domain multiplexing (TDM) is shown with 2 signals.

For Message Signal 1:

Amplitude (Am) = 5

Time period (T_1) = 0.125 — 0.025 = 0.1 sec

Frequency (f_1) = 1 / 0.1 = 10 Hz

For Message Signal 2:

Amplitude (Am) = 5

Time period (T_2) = 0.15 — 0.05 = 0.1 sec

Frequency (f_2) = 1 / 0.1 = 10 Hz

After Demultiplexing,

For Demultiplexed Signal 1:

Amplitude (A) = 5 = Am

Time period (T) = 0.125 — 0.025 = 0.1 sec = T_1

Frequency (f) = 1 / 0.1 = 10 Hz = f_1

For Demultiplexed Signal 2:

Amplitude (A) = 5 = Am

Time period (T) = 0.15 — 0.05 = 0.1 sec = T_2

Frequency (f) = 1 / 0.1 = 10 Hz = f_2

Hence, the Amplitude and Frequency of the demultiplexed signals are same as that of the original signals

Conclusion:

By taking two sinusoidal signal as message signals, a TDM signal was obtained and it was verified by matching the characteristics (frequency and amplitude) of the demultiplexed signals with the original message signals.