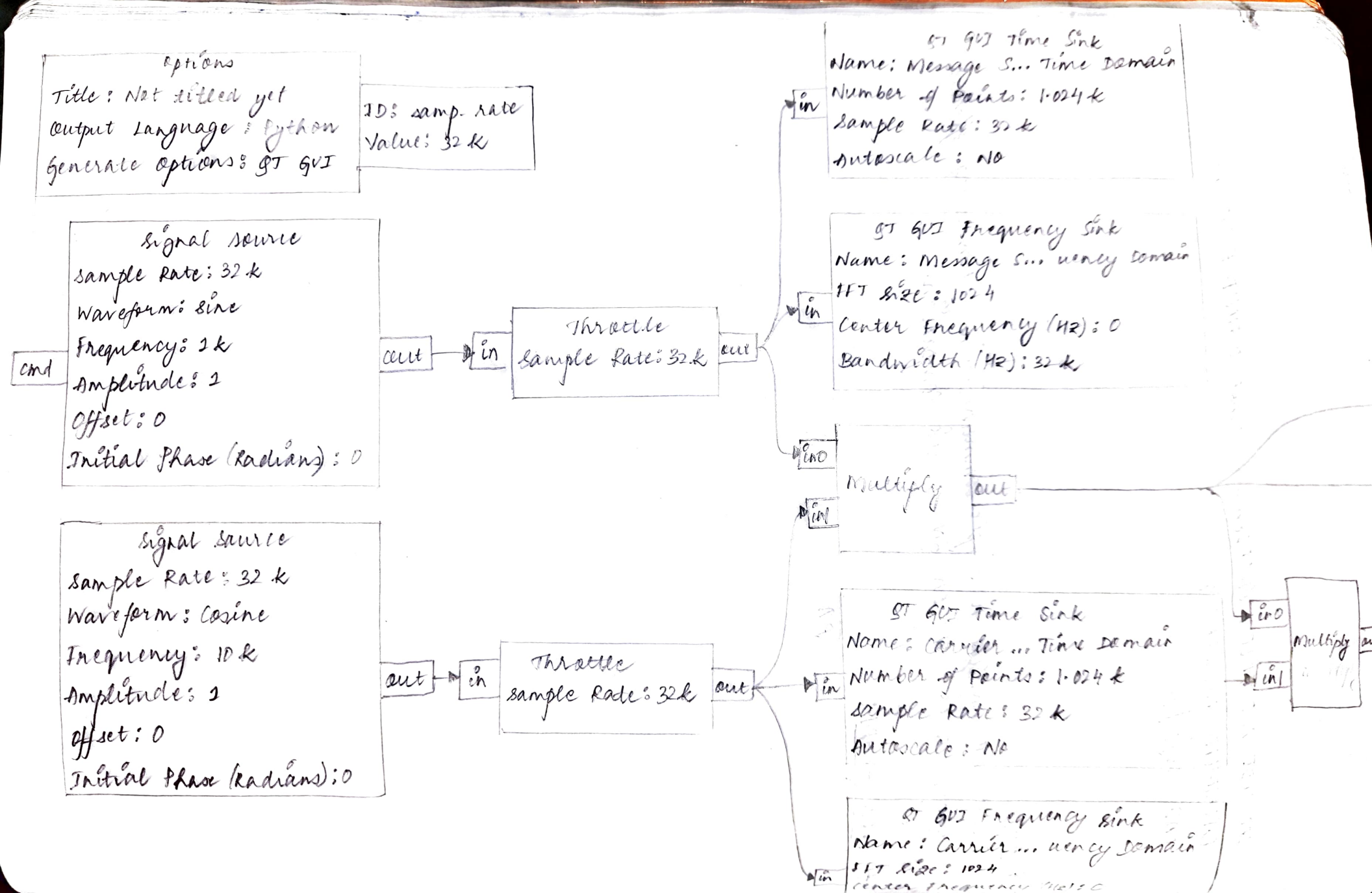
LAB CODE AND TITLE: 19CCE284 - SOFTWARE DEFINED RADIO LAB
EXPERIMENT NUMBER: 7
DATE: 20/06/2022

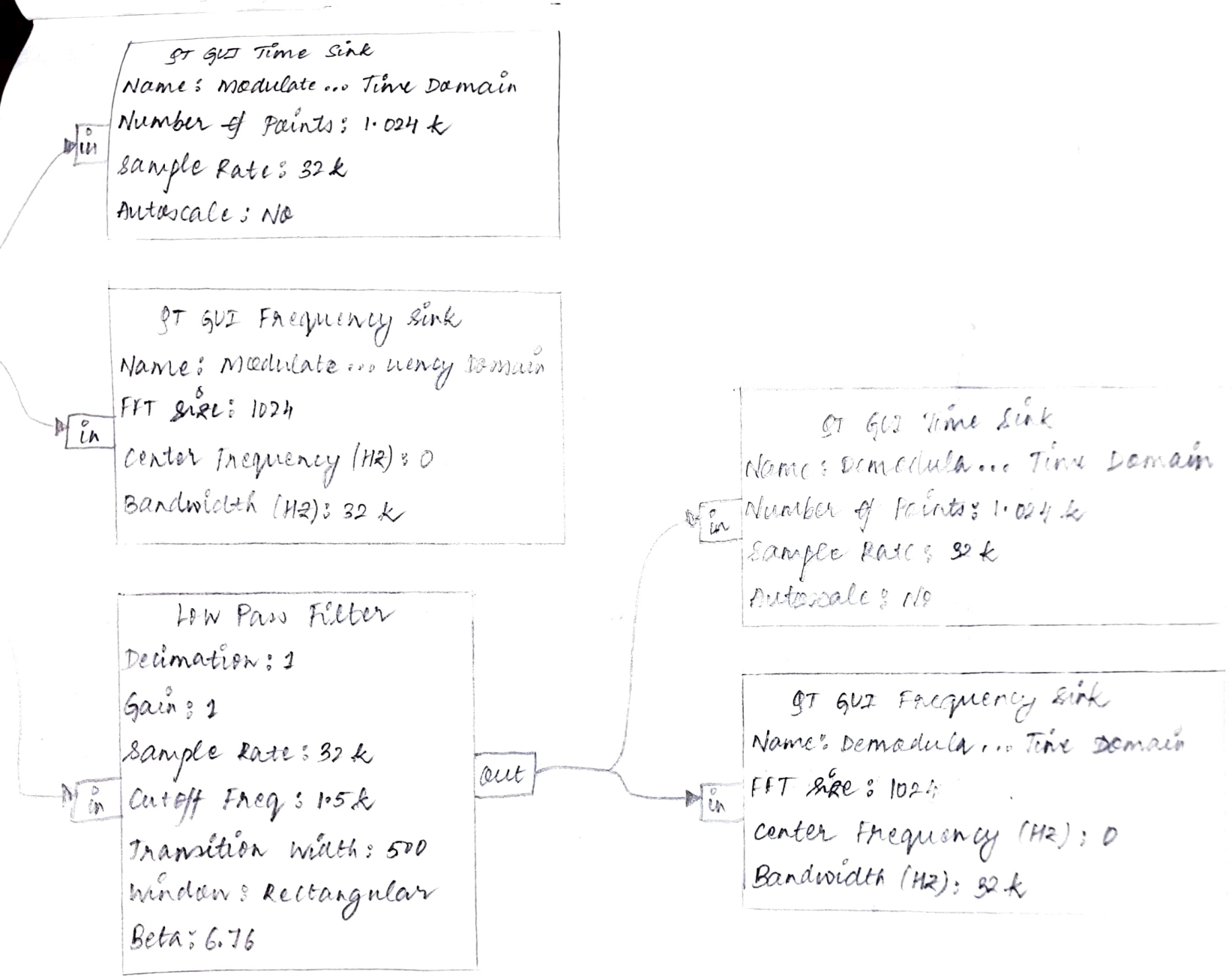
* AIM:

Design and analyse a simple communication system using software defined radio (SDR) on GNU Radio Companion.

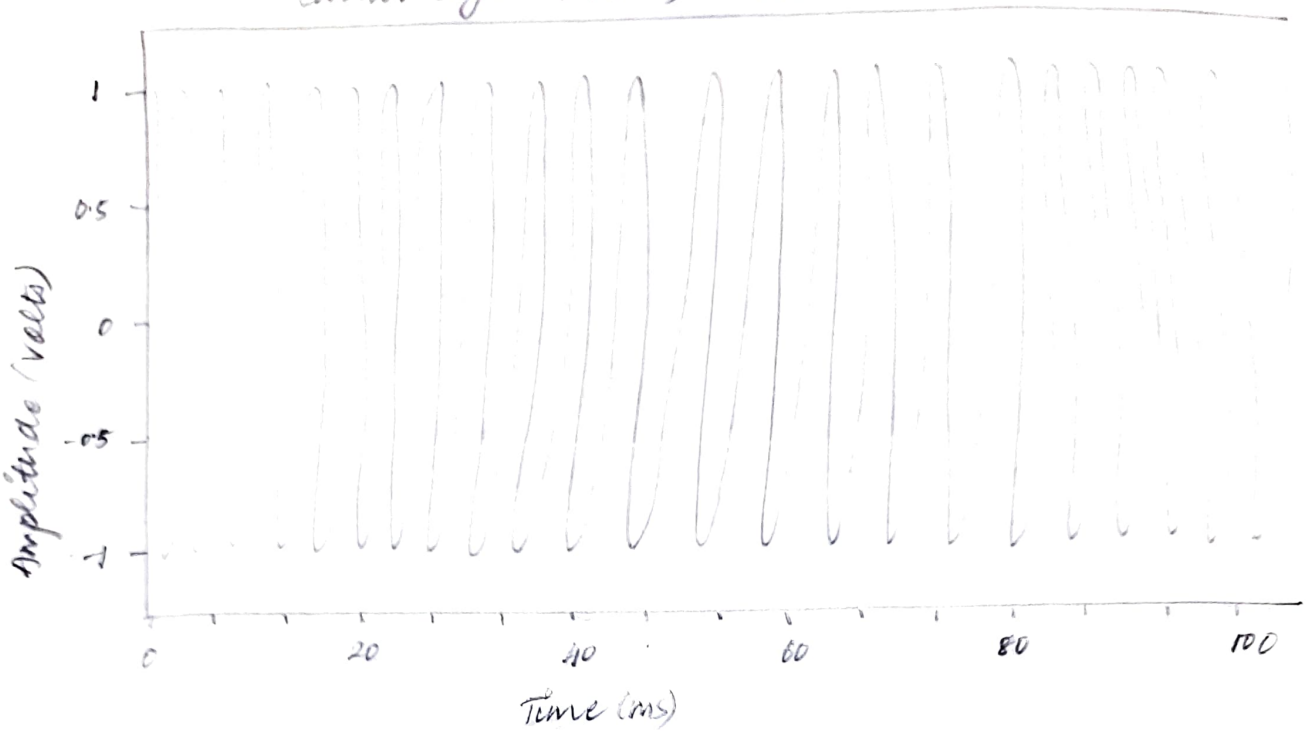
* FLOW GRAPH:

PTO

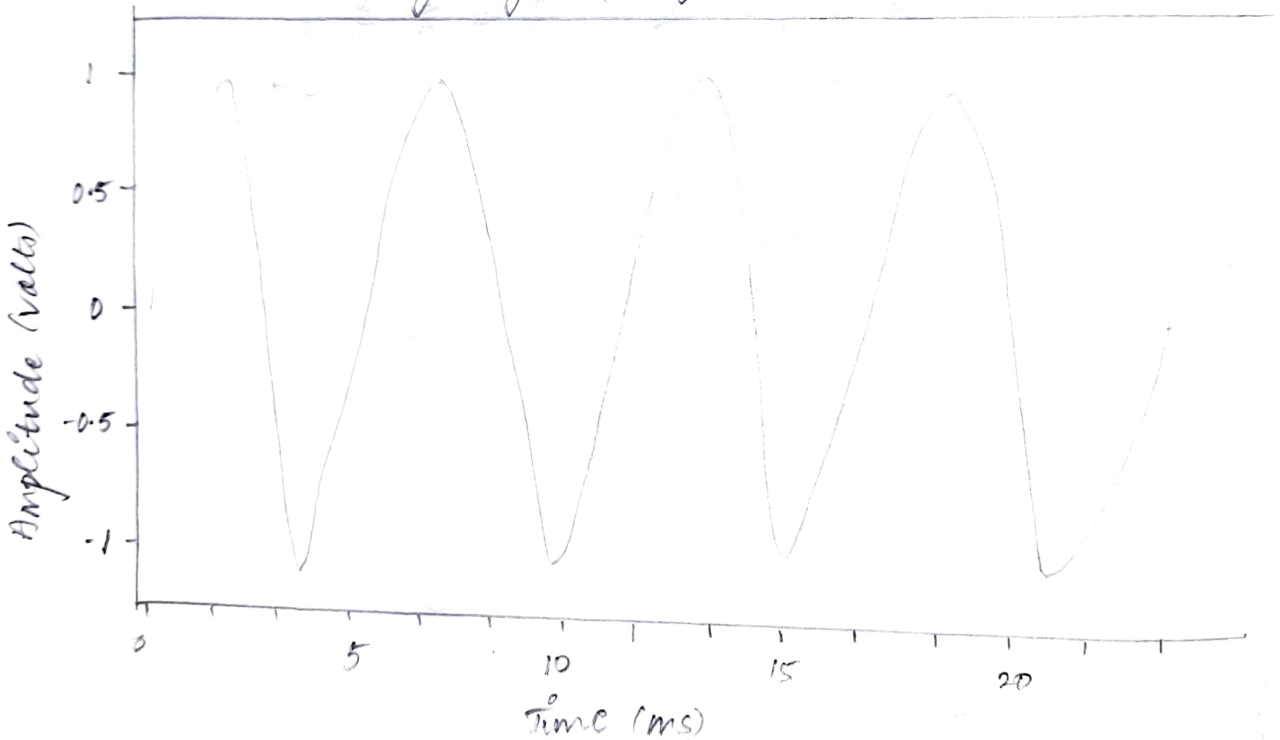

Options
Title: Not titled yet
Output Language: Python
Generate Options: QT GUI
ID: samp_rate
Value: 32k
Signal Source
Sample Rate: 32k
Waveform: Sine
Frequency: 1k
Amplitude: 1
Offset: 0
Initial Phase (Radians): 0
cmd
out
Signal Source
Sample Rate: 32k
Waveform: Cosine
Frequency: 10k
Amplitude: 1
Offset: 0
Initial Phase (Radians): 0
out
in
Throttle
Samples Rate: 32k
out
Throttle
Samples Rate: 32k
out
in
QT GUI Time Sink
Name: Message S... Time Domain
Number of Points: 1.024k
Sample Rate: 32k
Autoscale: No
QT GUI Frequency Sink
Name: Message S... ency Domain
FFT Size: 1024
Center Frequency (Hz): 0
Bandwidth (Hz): 32k
in0
in1
Multiply
out
QT GUI Time Sink
Name: Carrier ... Time Domain
Number of Points: 1.024k
Sample Rate: 32k
Autoscale: No
QT GUI Frequency Sink
Name: Carrier ... ency Domain
FFT Size: 1024
Multiply

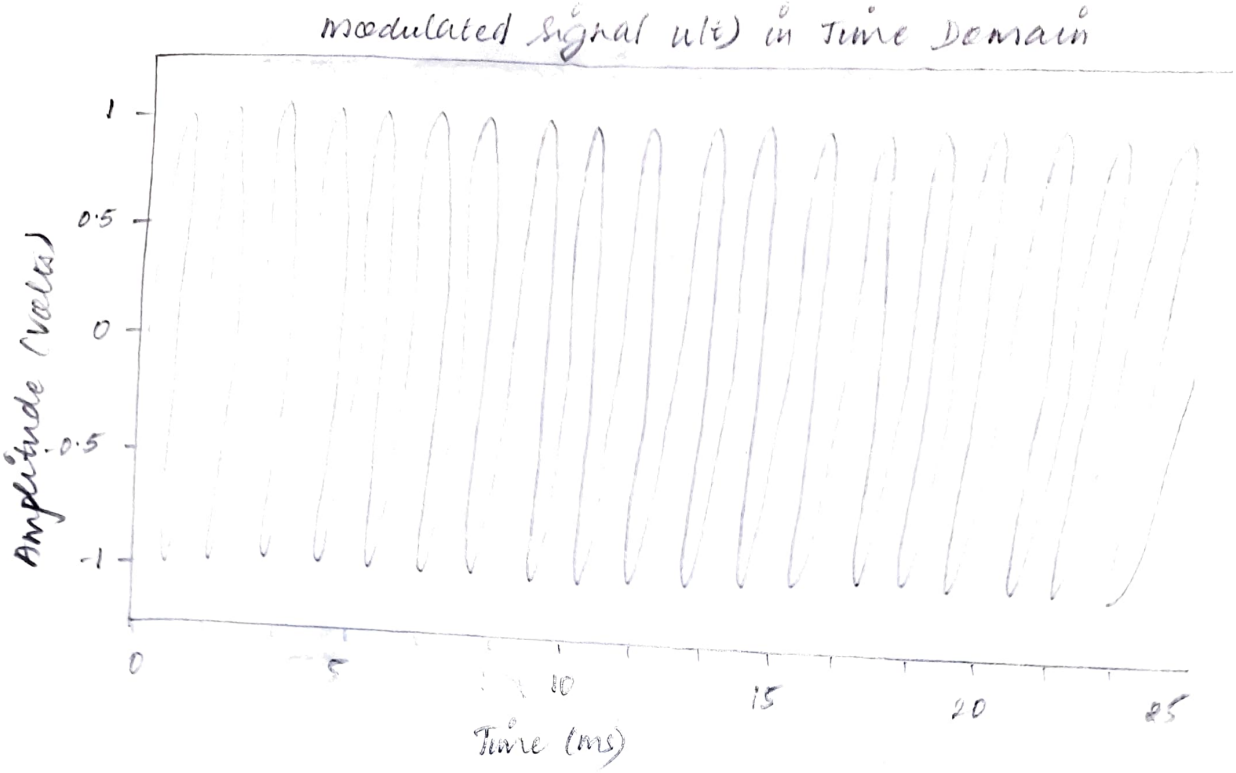

QT GUI Time Sink
Name: Modulate ... Time Domain
Number of Points: 1.024 k
Sample Rate: 32 k
Autoscale: No
in
QT GUI Frequency Sink
Name: Modulate ... uency Domain
FFT Size: 1024
Center Frequency (Hz): 0
Bandwidth (Hz): 32 k
in
Low Pass Filter
Decimation: 1
Gain: 1
Sample Rate: 32 k
Cutoff Freq: 1.5 k
Transition Width: 500
Window: Rectangular
Beta: 6.76
in
out
QT GUI Time Sink
Name: Demodula ... Time Domain
Number of Points: 1.024 k
Sample Rate: 32 k
Autoscale: No
in
QT GUI Frequency Sink
Name: Demodula ... Time Domain
FFT Size: 1024
Center Frequency (Hz): 0
Bandwidth (Hz): 32 k
in

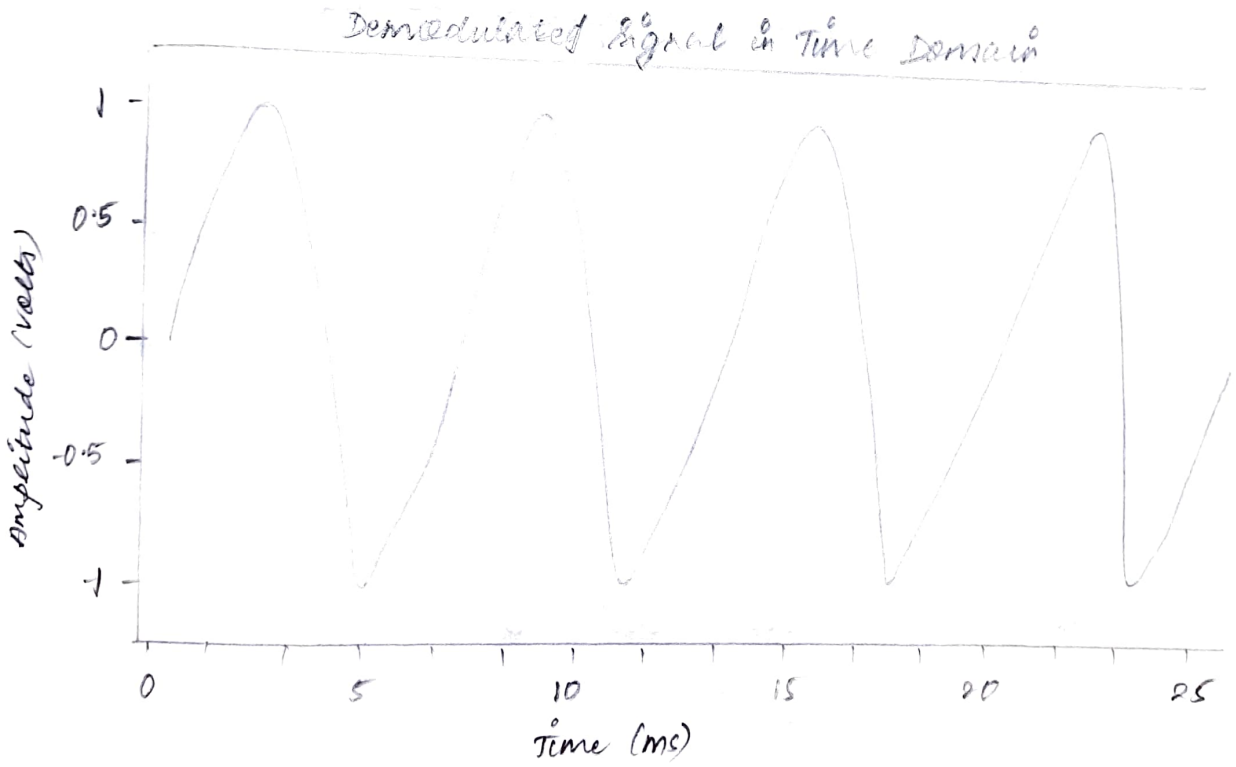
carrier Signal (cosine) in Time Domain



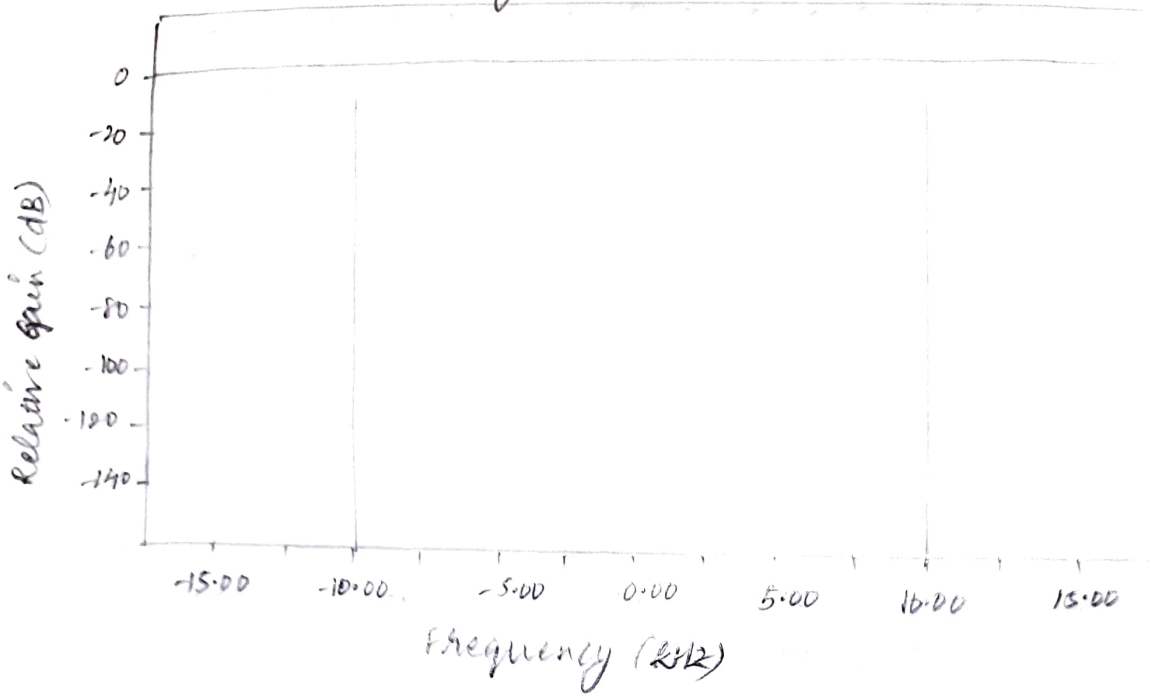
Message Signal (sine) in Time Domain



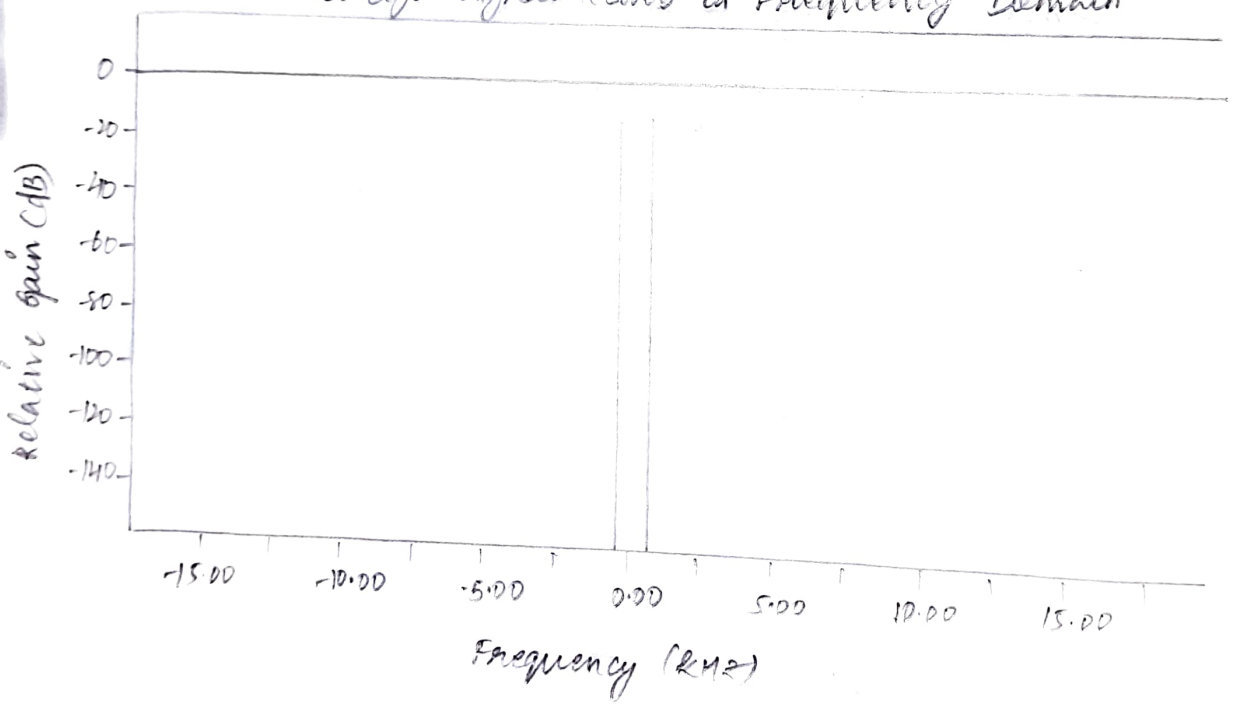

Modulated Signal u(t) in Time Domain
Amplitude (Volts)
1
0.5
0
-0.5
-1
0
5
10
15
20
25
Time (ms)

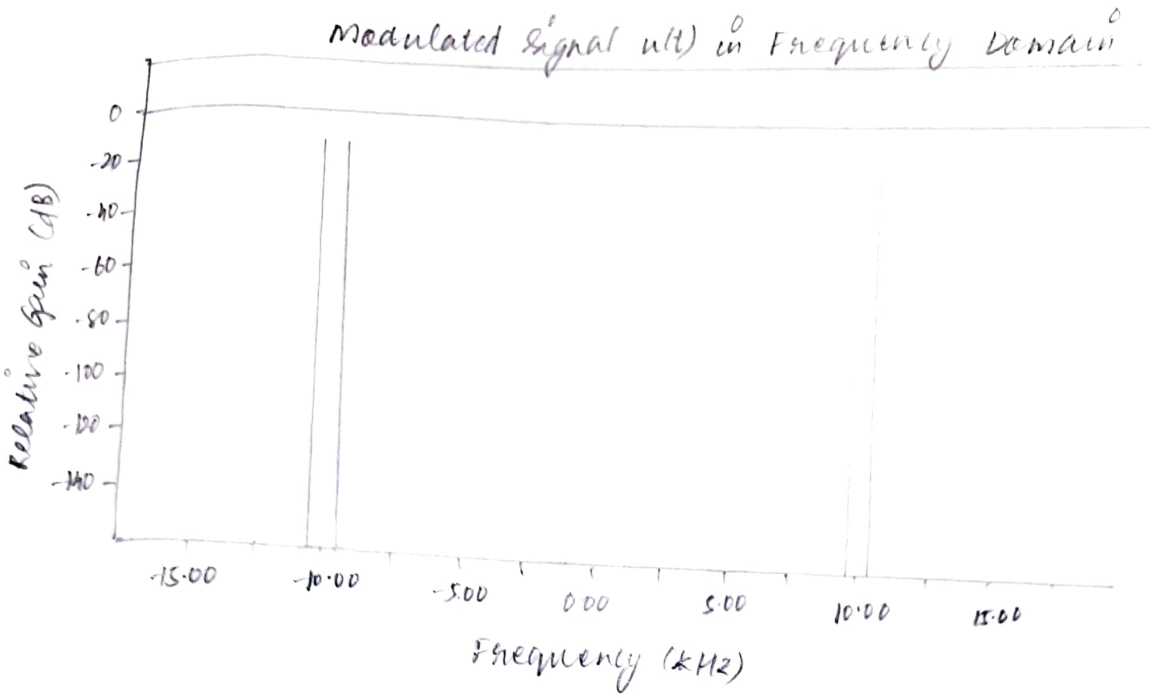

Demodulated Signal in Time Domain
Amplitude (Volts)
1
0.5
0
-0.5
-1
0
5
10
15
20
25
Time (ms)

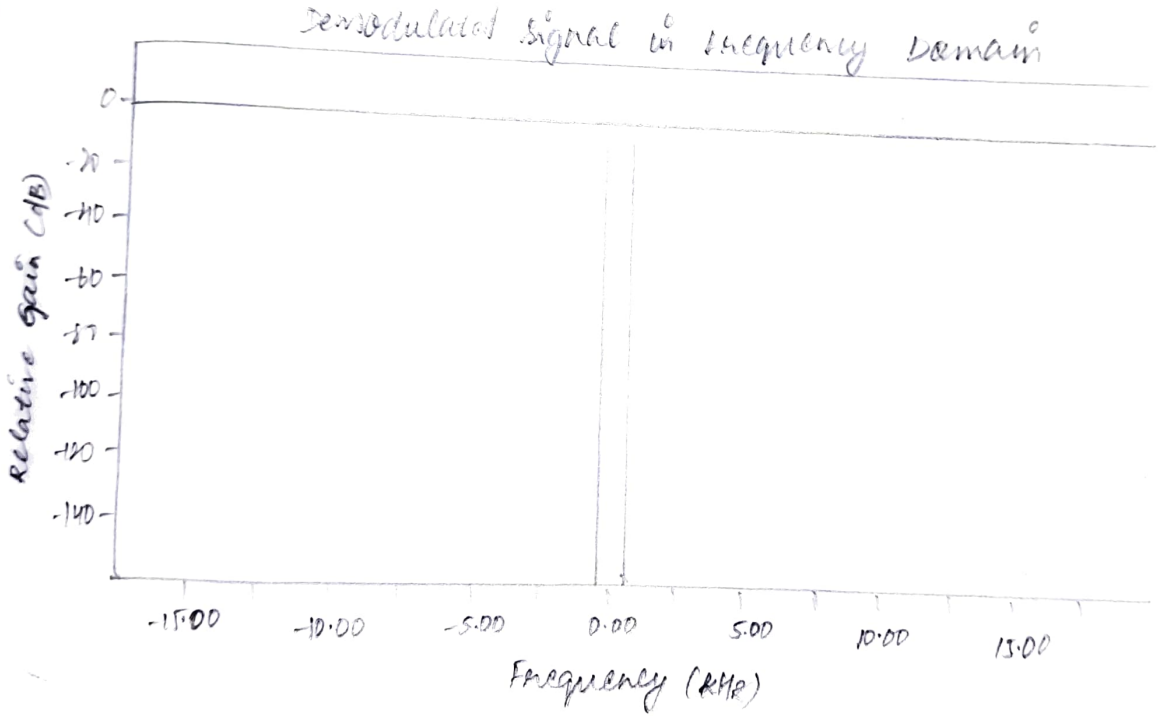
Carrier Signal (cosine) in Frequency Domain



Message Signal (sine) in Frequency Domain







* **RESULT:**

Thus, designed and analyzed a simple communication system using Software Defined Radio (SDR) on GNU Radio companion. All the simulation results were verified successfully.