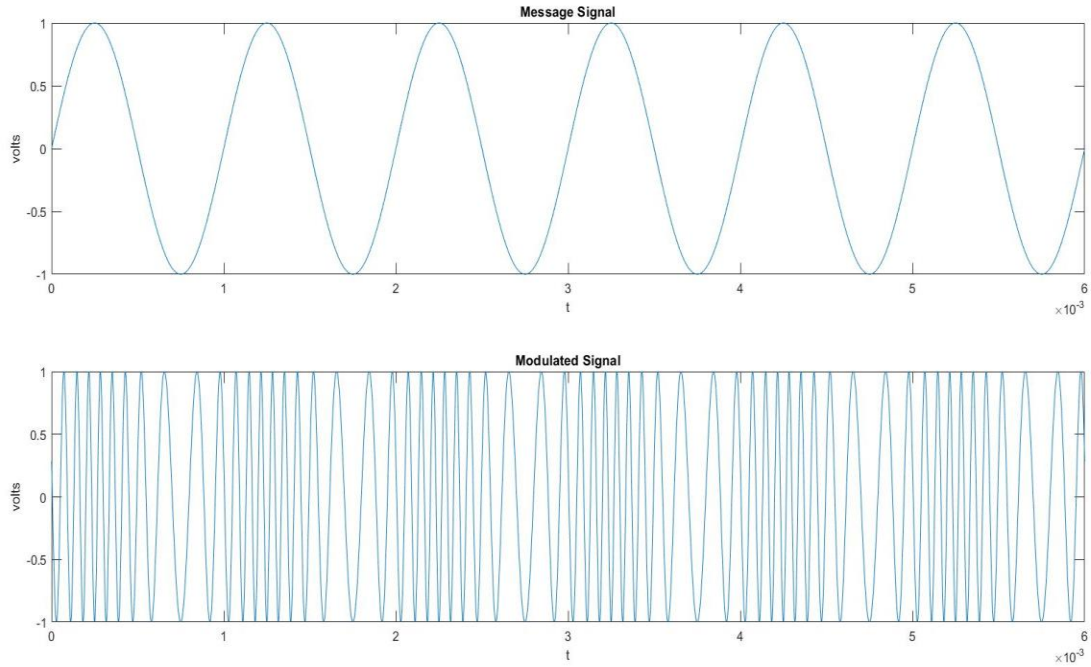
EE 304P
Communication Theory Lab
Lab assignment – 1

1.



fm = 1000 Hz

fc = 10 MHz

kf = 2 × π × 1000

Am = 5

Ac = 1

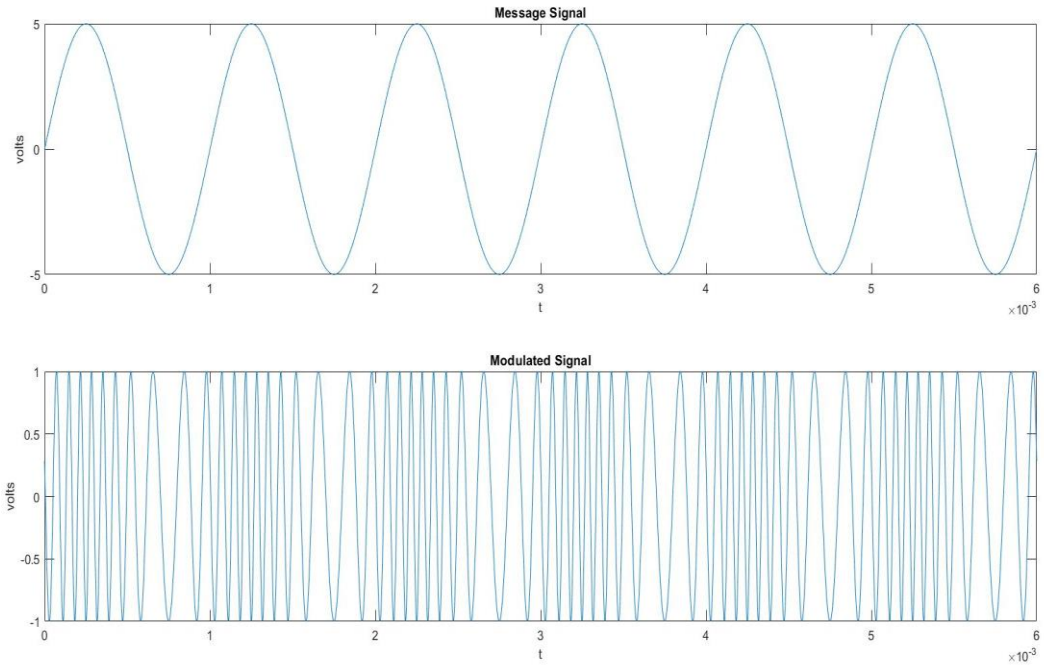
Message signal:
mt=Am*sin(2*pi*fm*t)

Carrier signal:
ct=Ac*sin(2*pi*fc*t)

Modulated signal:
Fm=Ac*cos(2*pi*fc*t-(kf*Am*cos(2*pi*fm*t))/(2*pi*fm))

- When Am is positive, modulated signal has higher frequency.
- When Am is negative, modulated signal has lower frequency.

2.



fm = 1000 Hz

fc = 10 MHz

kf = 2 × π × 5000

Am = 1

Ac = 1

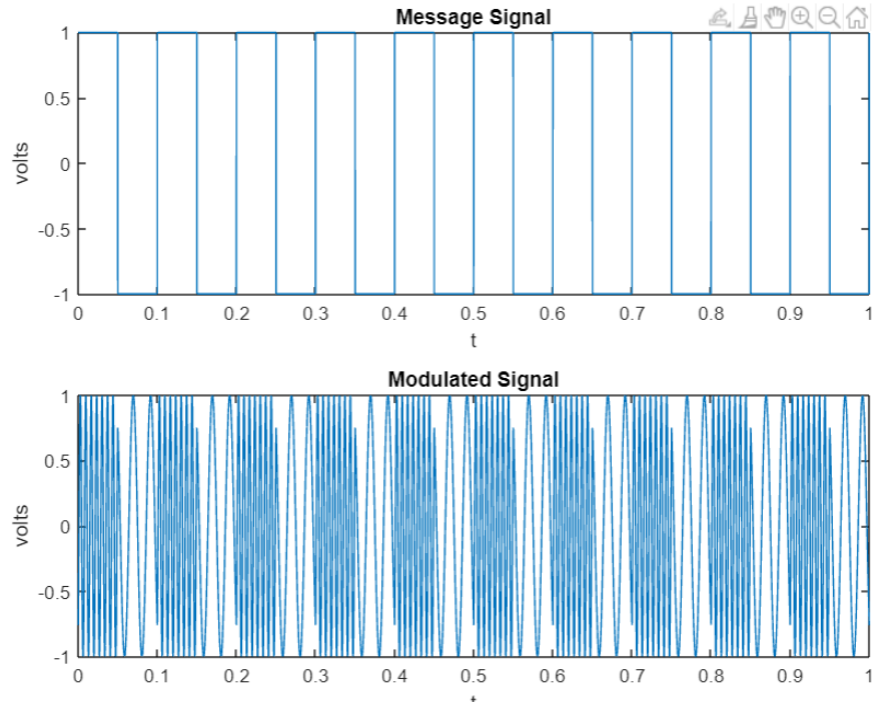
Message signal:
mt=Am*sin(2*pi*fm*t)

Carrier signal:
ct=Ac*sin(2*pi*fc*t)

Modulated signal
Fm=Ac*cos(2*pi*fc*t-(kf*Am*cos(2*pi*fm*t))/(2*pi*fm))

- When Am is positive, modulated signal has higher frequency.
- When Am is negative, modulated signal has lower frequency.

3.



fm = 10 Hz

fc = 50 Hz

kf = 2 × π × 150

Am = 1

Ac = 1

Message Signal
mt= square(2*pi*fm*t)

Carrier Signal
ct= Ac*sin(2*pi*fc*t)

Modulated Signal
Fm=Ac*cos(2*pi*fc*t +(kf/(2*pi*fm))*sawtooth(2*pi*fm*t,0.5))

- When Am is positive, modulated signal has higher frequency.
- When Am is negative, modulated signal has lower frequency.
- fc is a lot smaller here than in the previous cases. This makes it easier to observe changes in frequency of FM signal.