به نام خدا

دانشگاه تهران
دانشکده مهندسی برق و کامپیوتر
اصول سیستم های مخابراتی

تمرین کامپیوتری دوم

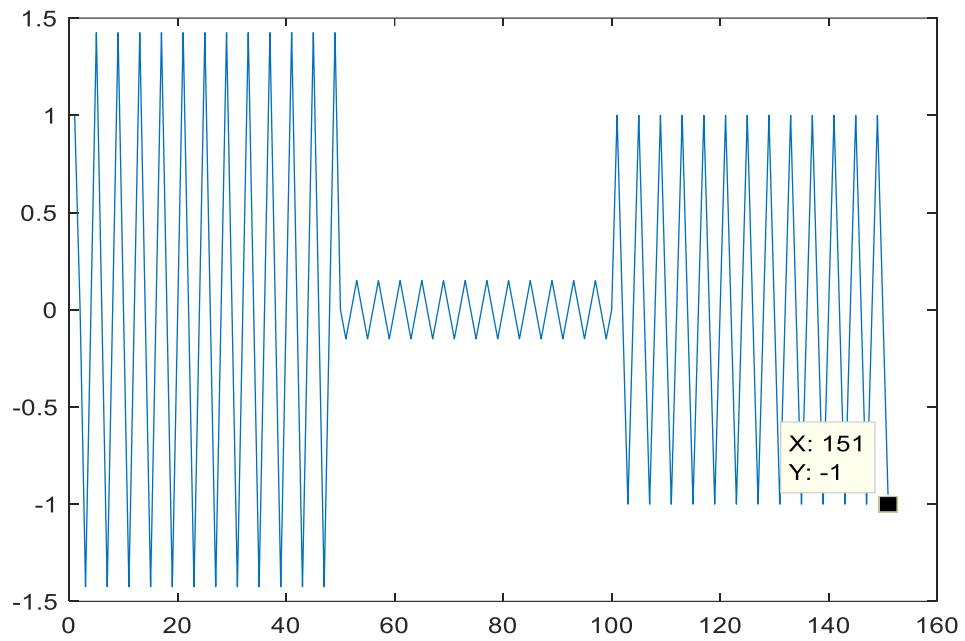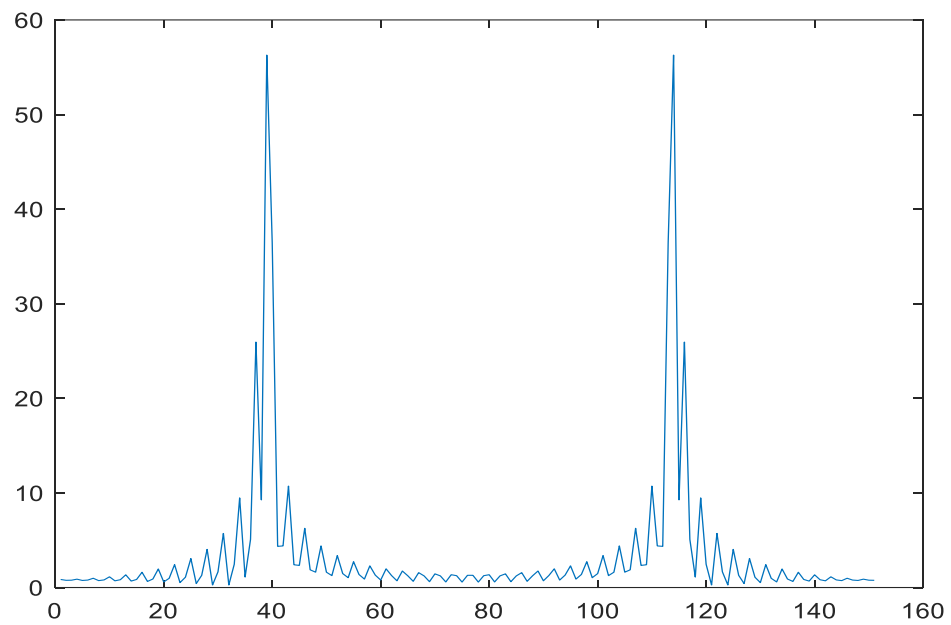|	
سیاوش شمس	نام و نام خانوادگی
۸۱۰۱۹۷۶۴۴	شماره دانشجویی
۹۹/۹/۳	تاریخ ارسال گزارش

فهرست گزارش سوالات

a)
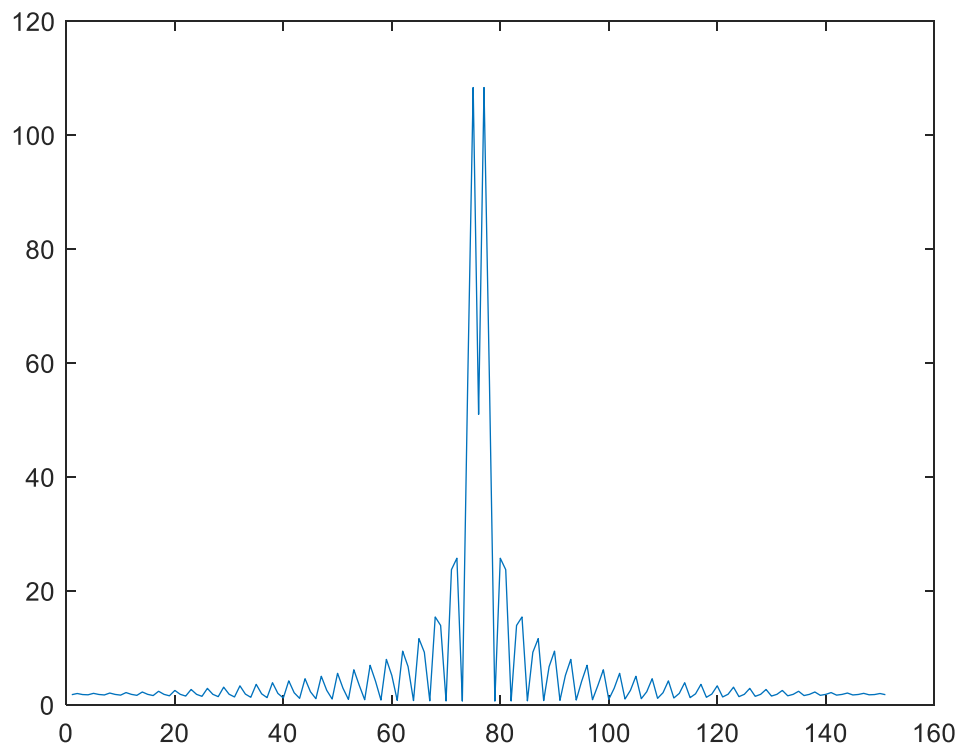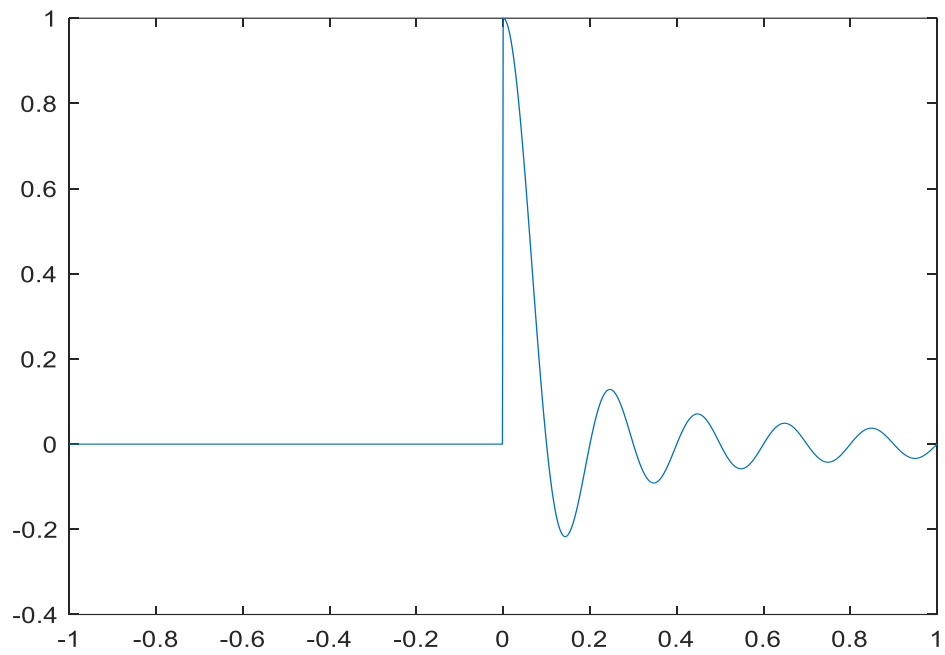

Modulated signal waveform

b)

Modulated signal spectrum
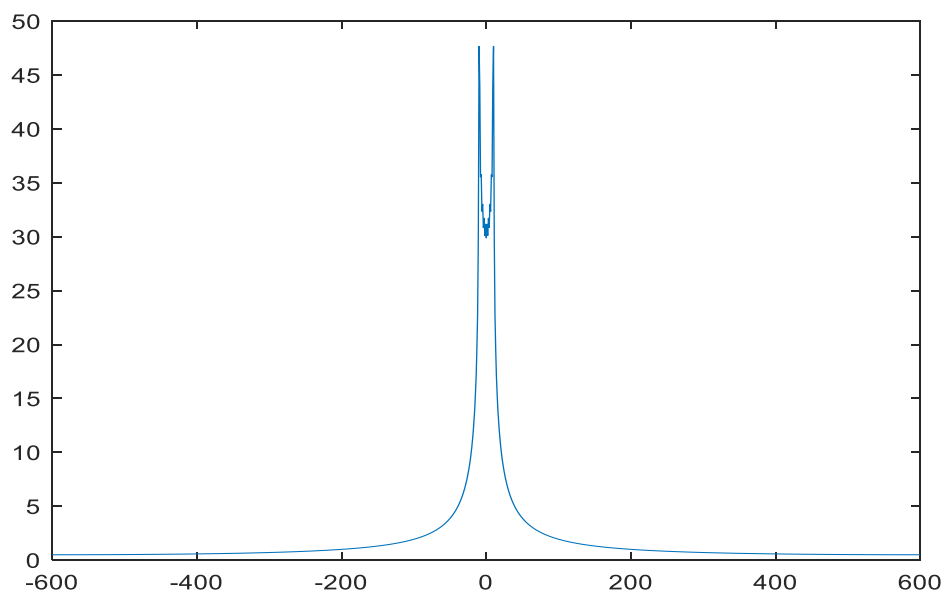
Message signal spectrum

c) power of normalized signal = 0.2488

power of signal = 0.5053

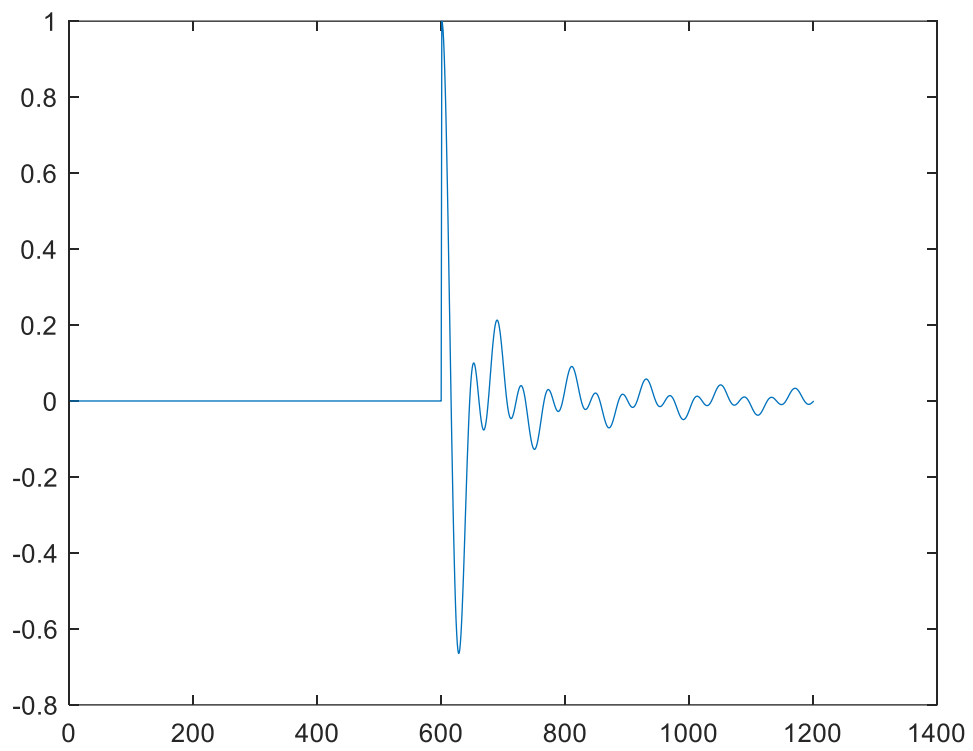modulation efficiency = $\frac{P_S}{P_t} = \frac{m^2}{2+m^2} = \frac{0.85^2}{2+0.85^2} = 26.5\%$

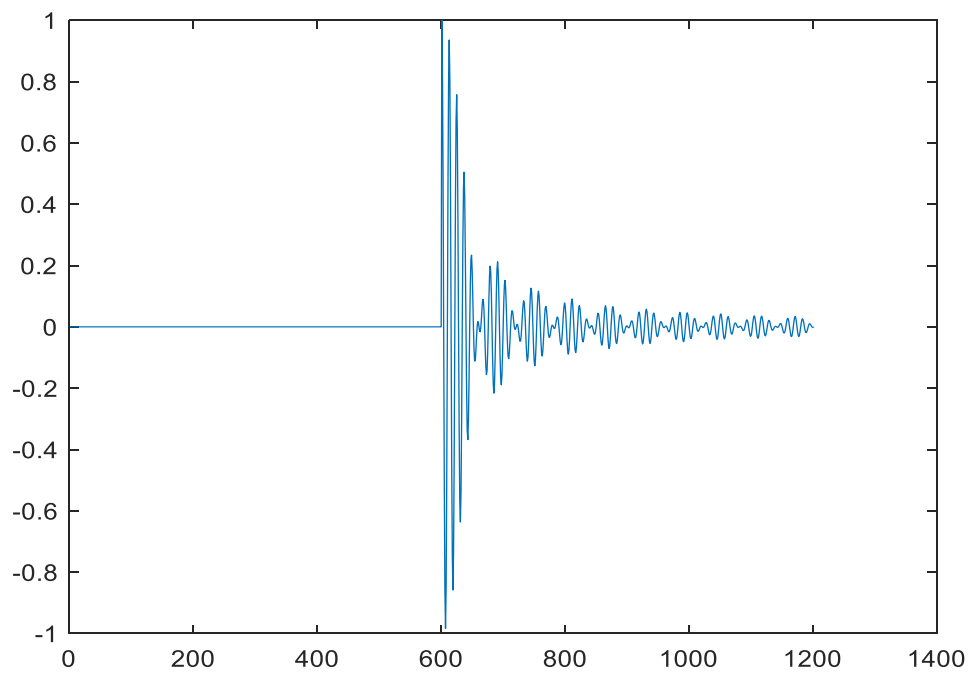the other way I considered Ac=1 : $\frac{total\ power - carrier\ power}{total\ power} = \frac{0.5053-0.5}{0.5053} = 1\%$

Message signal m(t)
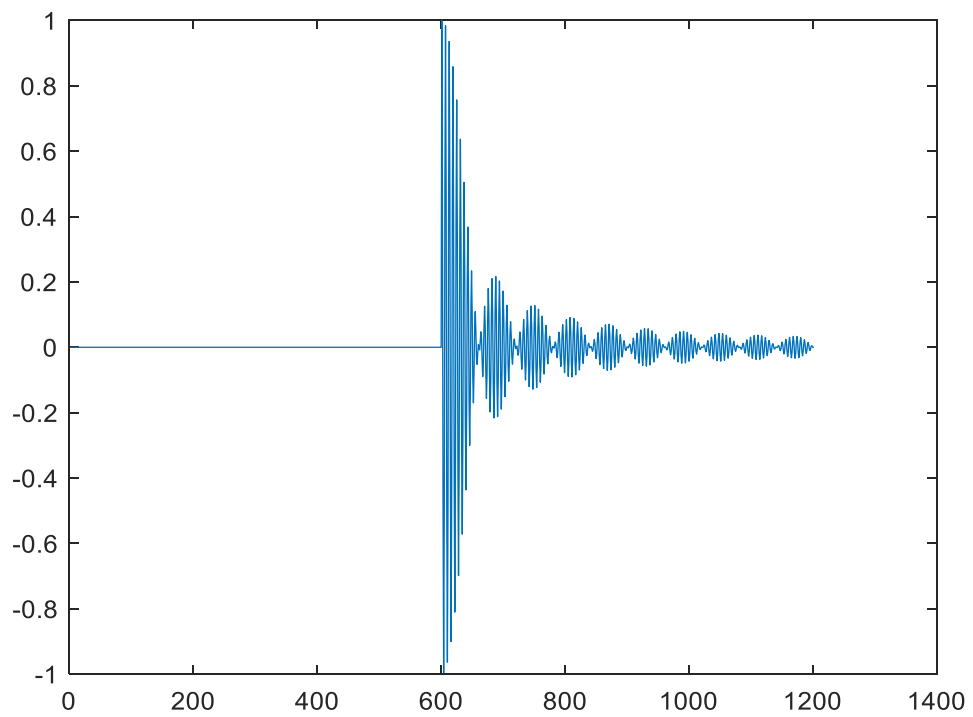

Spectrum of the message signal m(t)

Modulated signal at fc=10Hz
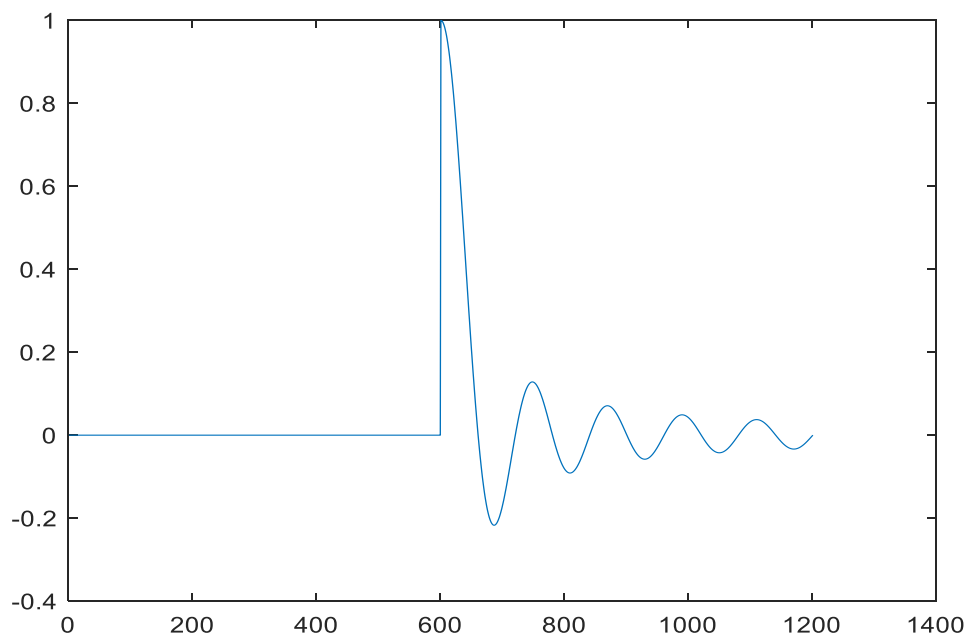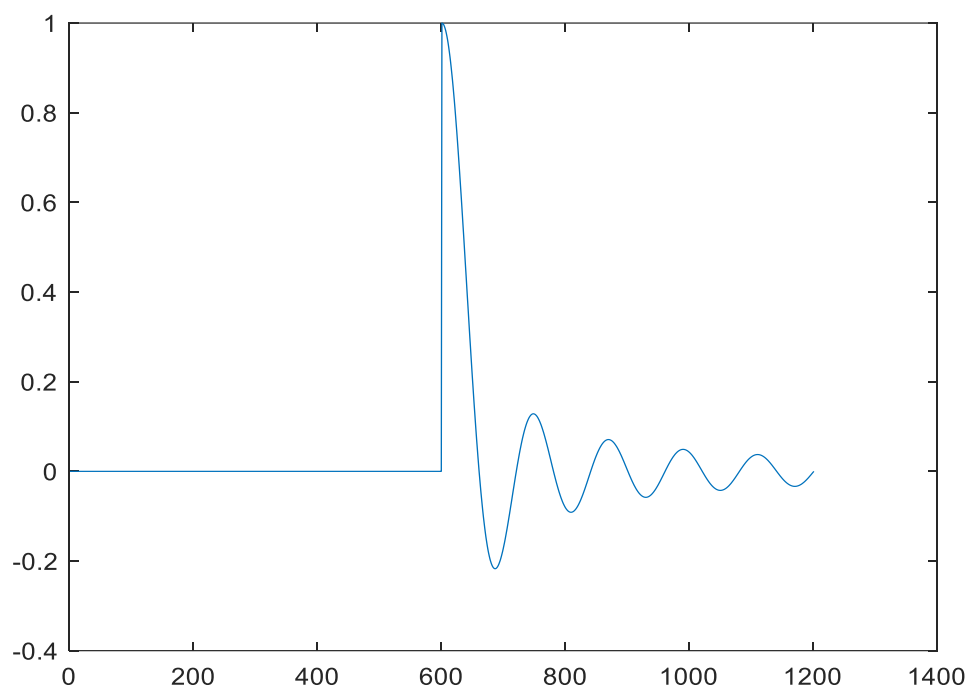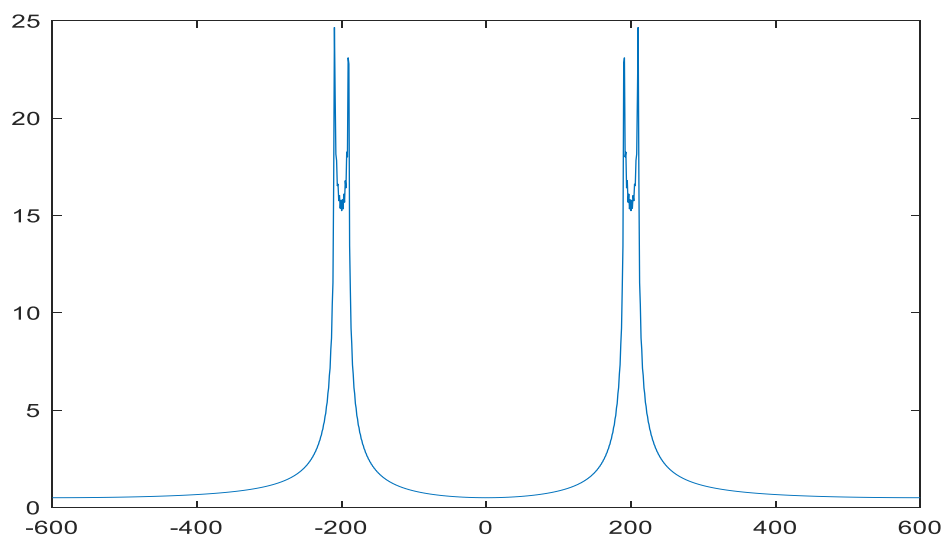
Modulated signal at fc=50H

Modulated signal at fc=100Hz
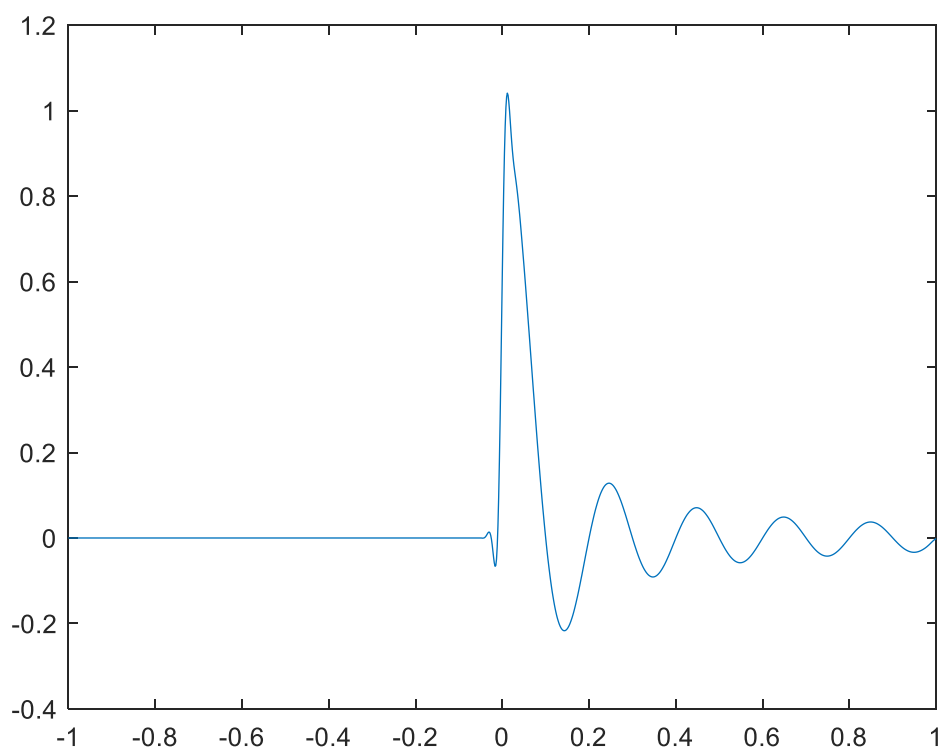
Modulated signal at fc=600Hz

Modulated signal at fc=1200Hz

There is no limit for the carrier frequency but it should not be factors of 300 Hz

b)

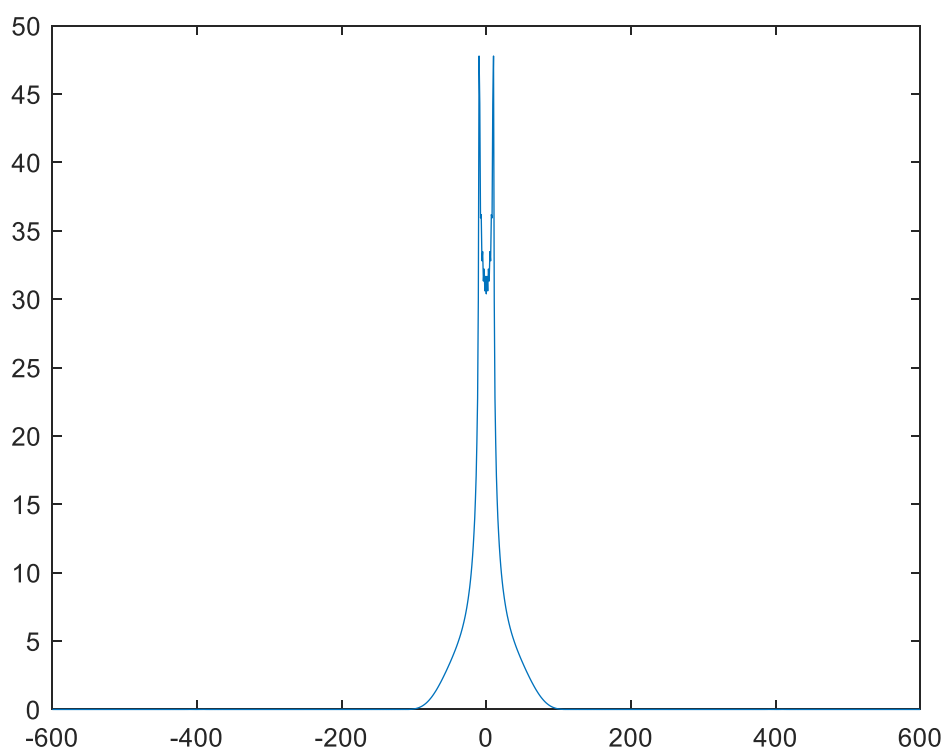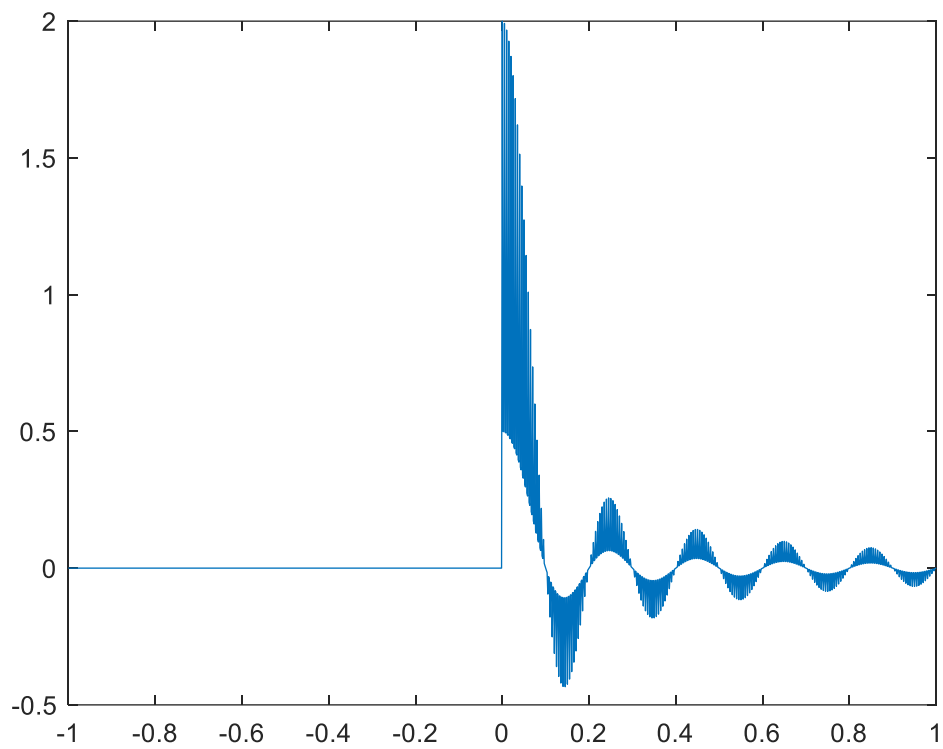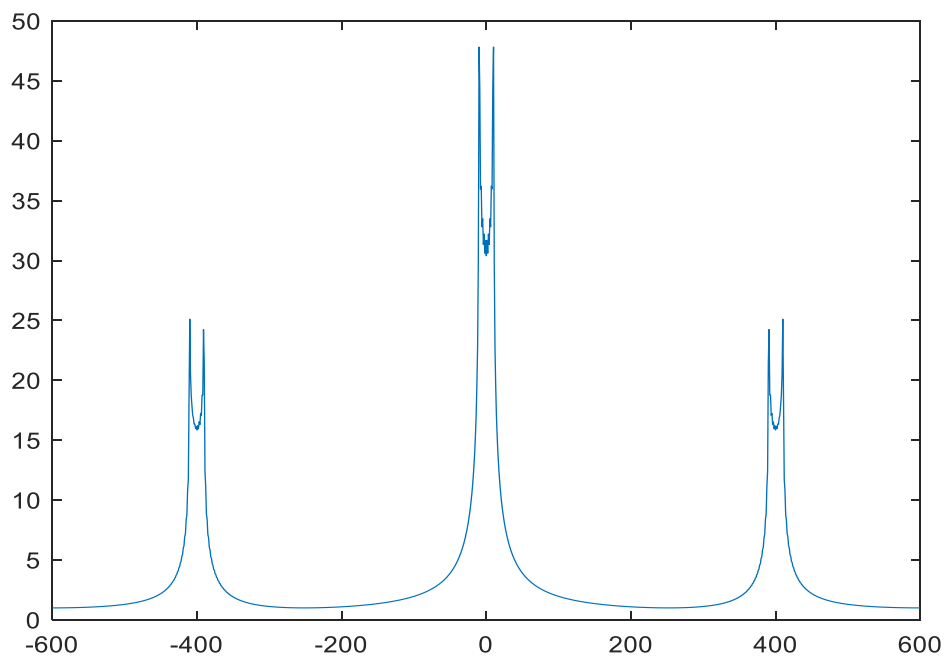Spectrum of the modulated signal with fc=100Hz

Z(t)

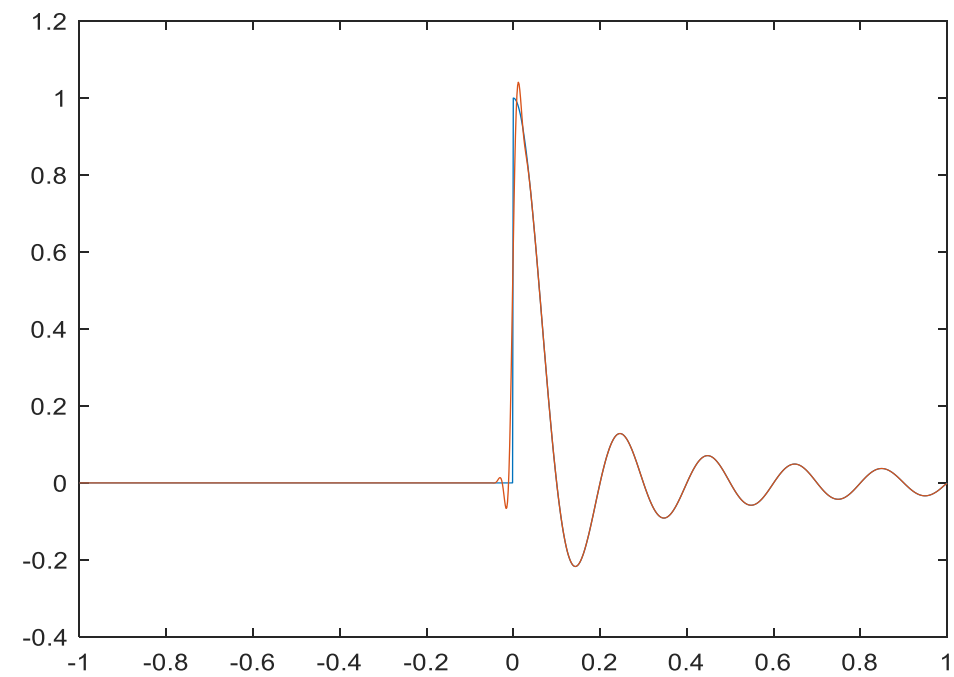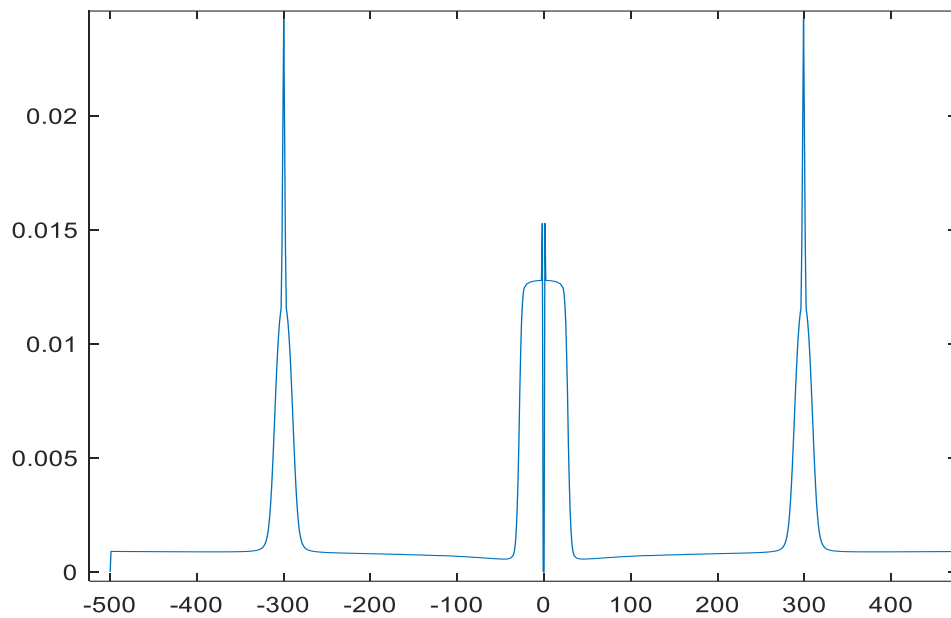
Spectrum of Z

Y(t)

Spectrum of Y

Extracted signal and main signal

MSE = 6.8479e-04

MSE at different frequencies

From above graph we can see that if we choose fc around 50 Hz it has the least error. But if we choose fc around factors of 300 it will have significant error.