**1. Your report should be written in English. The report should include the code (with comments or notes), the resulted figure (or print-screen), and a short discussion on the result if necessary.**

**2. Upload: .m file, .fig file and .doc report**

**3. Pack all the above files and send to 1315480535@qq.com**

**4. The format of pack name: LabX\_ID\_Name.zip, X is the experiment number.**

**5. Deadline: Thursday in Next week.**

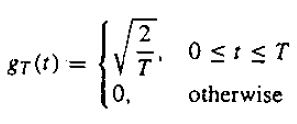
**Complete the following tasks:**

1. Consider 16QAM modulation. The signals are:



where



,

where *d*=1, *T*=1, fc=5Hz.

(1) Simulate the **bit error rate** of 16QAM system when SNR (average bit SNR) equals 5dB.

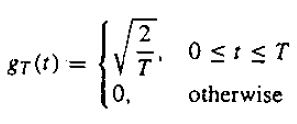
(Follow the code of Problem 7.6)

2. Consider the following 8QAM modulation:



(1) The waveform can be defined by the following form.





Give the values of Amc and Ams for each constellation point.（What are the corresponding basis signals?）

(2) Plot all possible 8QAM waveforms in time domain, sampling frequency fs=1000Hz and fc=5Hz. （分别画八个信号，一个周期内）

(3) How to calculate the average energy per symbol and per bit of 8QAM, respectively?

(4) Simulate the symbol error rate of 8QAM when SNR-per-bit=5dB.

3. Consider the following 3FSK modulation:



where fc=10Hz, Es=1, T=1, M=3, 

(1) Plot all possible 3FSK waveforms in both time and frequency domain. The sampling frequency fs=1000Hz