Assignment # 1

Due date:

Total Marks: 50

1. Create a MATLAB/C/C++ subroutine for generation of discretized 1023 chips long PRN codes for GPS satellites identified by PRN 1-32. Subroutine shall take satellite PRN number and sampling frequency as input and output a 1023 chips long PRN code. [10]

Refer Table 3-I, Code Phase Assignments of the interface specification document **IS-GPS-200 Revision D**, 7 December 2004.

2. Write a MATLAB/C/C++ program to compute circular autocorrelation of PRN 8 with a delayed PRN code by 200 chips and plot the results. Use the subroutine of Question 1. [5]
3. Write a MATLAB/C/C++ program to compute circular cross correlation of PRN 8 with a delayed copy of a PRN 16 by 900 chips and plot the results. Use the subroutine of Question 1. [5]
4. Write a MATLAB/C/C++ program to compute circular autocorrelation of PRN 8 with a noisy PRN code delayed by 200 chips and plot the results. Assume the noise is white Gaussian additive and generated with mean zero and standard deviation of 4. Use the subroutine of Question 1 for generation of discretized PRN code. [10]
5. Write a MATLAB/C/C++ program to implement parallel code phase search acquisition algorithm. Identify the satellites (PRN IDs), carrier frequency and code phase using parallel code phase search acquisition algorithm in the data file: "GPS_data_Fs16368KHz_IF4092KHz.dat". The data type is 'int8'. [20]

Note: Assignment submission should contain self explanatory MATLAB/C/C++ programs with appropriate comments and detail report with flow charts and required mathematics.