

CIS 6930 - Fall 2018 - Homework 3
Due: Tuesday, October 16th, 2018 — Professor Patrick Traynor

Name: _____

Grade: _____ (45)

Answers can be typed or handwritten, but must be legible. You MUST show all work to receive any credit. The assignment is due at the beginning of class and all pages must be stapled together. Homework is an individual effort - please see the course webpage of check with Dr. Traynor if you have questions about collaboration.

1. (*20pts*) Consider the following system: total system bandwidth of 8 MHz, carrier frequency of 160 kHz and the network relies on FDD for carrying forward and reverse channels. Each carrier can support 8 voice channels using TDMA. If the frequency re-use factor in the network is 7, and the network covers 1,000 square miles, determine the blocking probability on the air interface for cell sizes of 0.5 mi^2 , 1 mi^2 and 10 mi^2 assuming that users make/receive a combined 5 voice calls per hour, calls last an average of 3 minutes and there are 40 users/ mi^2 .

4. (5pts) The same provider from above also considers a new MSC/VLR system with 8 processors, each capable of 125 operations per second. What would the probability of blocking be if these new devices were deployed? Which device should the company purchase and why?