Habib University - City Campus
Course Title: EE 422 – Wireless & Mobile Communications
Instructor's name: Dr Aamir Hasan
Class ID: 1167, Semester: Spring 2017
Total Marks: 40
Note - This assignment is worth 2x

Assignment No 02 – Due Date 12 Feb 18 (Hardcopy in Class)

Problems 1

Consider a city of 10 square kilometers. A macrocellular system design divides the city up into square cells of 1 square kilometer, where each cell can accommodate 100 users. Find the total number of users that can be accommodated in the system and the length of time it takes a mobile user to traverse a cell (approximate time needed for a handoff) when moving at 30 Km/hour. If the cell size is reduced to 100 square meters and everything in the system scales so that 100 users can be accommodated in these smaller cells, find the total number of users the system can accommodate and the length of time it takes to traverse a cell.

Problems 2

Consider a cellular system with diamond-shaped cells of radius R = 100 meter. Suppose the minimum distance between cell centers using the same frequency must be D = 600 m to maintain the required SINR.

(a) Find the required reuse factor N and the number of cells per cluster.

(b) If the total number of channels for the system is 450, find the number of channels that can be assigned to each cell.

Problems 3

Consider a cellular system with hexagonal cells of radius R = 1 Km. Suppose the minimum distance between cell centers using the same frequency must be D = 6 Km to maintain the required SINR.

(a) Find the required reuse factor N and the number of cells per cluster.

(b) If the total number of channels for the system is 1200, find the number of channels that can be assigned to each cell.

Problem No 4

Using MATLAB or LabVIEW, plot S/I (i.e. CCI) in dB versus Cluster Size, N, when N takes on the acceptable values between 1 and 30. Plot curves for exponential path loss, α, equal to 2, 3, 4 and 5.

Problem No 5 (Important Question)

Search, identify and propose a 20 minutes (minimum time) video that talks about the **'5G Cellular Standards'.**

After you have identified the video, write a one-page marketing flyer for the class – including details about the video. The flyer should identify the URL of the video. Flyer should contain the name of the student and propose a title for the flyer (eg. "The shape-shifting future of the mobile phone").

Also, attach the flyer with your solution of Assignment No 02