TUTORIAL I

Q.1) Determine the no. of cells in a 'cluster' and locate the co-channel cells for the following values: j=2 and i=3.

Q.2) Determine the no. of full duplex channels available in a cluster and the total capacity for a cellular system where there are 10 clusters, each containing 20 cells with 18 channels in each cell.

Q.3) How many full duplex channels are required in each cell for a cellular system with 12 clusters, 15 cells per cluster and a total capacity of 3960 full duplex channels?

Q.4) Determine the no. of cells in a cluster for the following values: i=4 and j=3.

Q.5) Determine the co-channel reuse ratio for a cluster with 20 cells.

Q.6) Determine the co-channel reuse ratio for a cluster when the distance to the centre of the nearest co-channel cell is 4 km and the cell radius is 1.2 km.

Q.7) A cellular system has 32 cells with a cell radius of 1.6 km, total freq. BW that supports 336 traffic channels and a reuse factor of N=7.

a. Calculate the geographical area.

b. How many channels are there per cell?

c. What is the total no. of concurrent calls that can be handled?

Q.8) Consider four different cellular systems that share the following characteristics: The freq. bands are 825-845 MHz for mobile unit transmission and 870-890 MHz for base station transmission. A duplex circuit consists of one 30 kHz channel in each direction. The systems are distinguished by a reuse factor which is 4,7,12 and 19 respectively.

a. Suppose that in each of the systems, the cluster of cells [4, 7, 12, 19] is duplicated 16 times. Find the no. of simultaneous communications that can be supported by each system.

b. Find the no. of simultaneous communications that can be supported by a single cell in each system.

c. Suppose that the cell size is same in all four systems and a fixed area of 100 cells is covered by each system. Find the no. of simultaneous communications that can be supported by each system.

Q.9) If a total of 33 MHz BW is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice channels and control channels. Calculate the no. of channels available per cell if a system uses

a. 4 cells reuse pattern

b. 7 cells reuse pattern