

# Information Technology-Wireless Networking - Home Work 5\_6

## Lecture 5

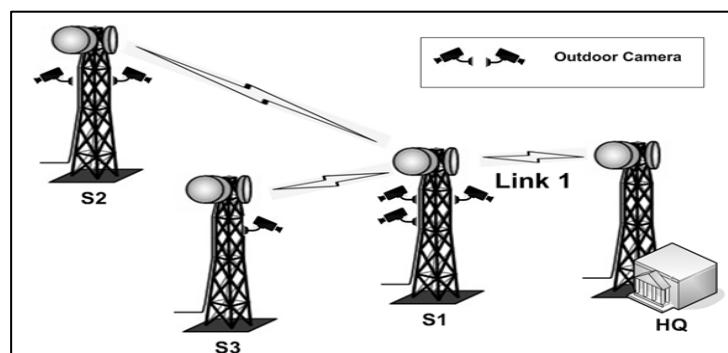
1. List the five GSM Generations showing speed and Technology used (Table Format)
2. Draw the four GSM Handover Categories.
3. Draw the GSM Architecture
4. Assume a system of total cells of 32 cells with a cell radius of 1.6km, a total frequency bandwidth that supports 336 traffic channels, and a reuse factor of N=7.
  - What is the geographic area covered?
  - How many channels are per cell?
  - What is the total number of concurrent calls that can be handled by all cells?
5. Design a GSM system with 2800 total concurrent calls, if you know that it has a total frequency bandwidth that supports 196 traffic channels, and a reuse factor of N=7 with the geographic area of 278 km<sup>2</sup>
  - How many channels are per cell?
  - What is the total number of cells?
  - What is the cell radius?

## Lecture 6

1. List 802.11 standards with features in table format
2. List and Explain about Wi-Fi Security Techniques in table format
3. Draw a typical WiFi Home Network
4. Draw the Collision Avoidance: RTS-CTS exchange diagram
5. Draw the 802.11: Passive/Active Scanning diagrams
6. In city wide Video Network, the number of cameras in each site can be counted from the network diagram below. The Link 1 features are:
  - Camera bandwidth requirement is 2 Mbps
  - TX power is 30 dBm,
  - Antenna Gain is 18 dBi for both sides
  - Antennas are integrated so cables have no losses.
  - Link 1 distance is in the table according to student name (Km)
  - Frequency is 5 GHz

The Receive Sensitivity table is

Parameters	SNR (Rx) [dB]	RECEIVER Sensitivity S <sub>R</sub> [dB]	Usefull Channel Capacity Cmodulation [Mbps]
QPSK CTC 1/2	3.5	-98.6561	4.0816
QPSK CTC 3/4	6.5	-97.4170	6.1224
16-QAM CTC 1/2	9.0	-96.1664	8.1633
16-QAM CTC 3/4	12.5	-94.4273	12.245
64-QAM CTC 2/3	16.5	-91.6767	16.327
64-QAM CTC 3/4	18.5	-90.1883	18.367



Calculate Link budget for Link1 with drawing.

.

No	Student Name	Q6 distance
1	Adam Muhammed Saber	4.7
2	Ahmed Ashti Ahmed	5
3	Ahmed Mahdi Ahmed	5.3
4	Ahmed Muayad Maghdid	5
5	Ali Dlshad Rostam	3.4
6	Ali Muhammed Ahmed	6.9
7	Anas Ahmed Ilhamdarweesh	5.7
8	Arman Beshr Ahmed	5.2
9	Avan Jamil Kakil	6.8
10	Awara Hemn Hasan	3.1
11	Aya Halmat Zyad	6.4
12	Bahjat Dedar Kakamin	4.3
13	Bayar Bashdar Majid Khudhir	3.4
14	Blnd Jamel Sabri	4.9
15	Chalak Barzan Hadi Mawlood	6.2
16	Chenar Farhad Othman	6.3
17	Eleka Ardalan Muhammed	5.1
18	Fahid Ihsan Sdeeq	6.7
19	Farshad Fathi Hamad	3.9
20	Fenik Hussin Jumaa	3.5
21	Hazhir Mamand Ahmed Dot	5.1
22	Kaiwan Kakl Hassan	6.3

No	Student Name	Q6 distance
23	Kale Qubad Aziz	4.4
24	Kaywan Faruq Kamal	4.6
25	Mahmood Emad Mohammed	5
26	Mawa Sarkawt Muhtasm	5.2
27	Mazen Mowaffak Al Seh	3.9
28	Muhammed Kakakan Ahmed	4.3
29	Mustafa Salim Sharif	6.2
30	Najla Salah Fatah	5.4
31	Noor Muhammedamin Osman	6.5
32	Rawan Bestun Kareem	5.6
33	Rozhin Muhammad Mustafa	6.8
34	Sahand Fahmi Mustafa	5.3
35	Sahar Fakher Muhammed	4.3
36	Sarwat Shukri Hamo	4.5
37	Shad Abdullah Hussein	6.9
38	Shanaz Khalil Kareem Majeed	5.3
39	Sivar Edres Hamad	3.5
40	Staish Farhan Asaad	5.2
41	Yaran Dlman Ebrahim	5.1
42	Zhewar Ali Mustafa	6.3
43	Aram Farhad	4.3
44	Huda Baker	4.3