(86) BE - sem - VII - CBGS - EXTC - MC

30/11/15

QP Code : 5916

[3 Hours]

Maximum Marks: 80

1.Question no.1 is compulsory.
2.Write any three questions from remaining five questions.
3.Assume suitable data where ever necessary.

Q1

a] Compare 2G, 3G and 4G with respect to speed, applications and bandwidth 05

b] If 36 Mhz total spectrum is allocated for a duplex wireless cellular System and simplex channel has 25Mhz RF bandwidth find Total number of duplex channels, Number of channels per cell if N=4 cell reuse is used. 05

c] Explain concept and importance of power control in CDMA 05

d] Explain fading effects due to Doppler spread 05

Q2.

a] If a signal to interference ratio of 15 dB is required for satisfactory Forward channel performance of a cellular system, what is frequency Reuse factor and cluster size that should be used for maximum capacity if path loss exponent is 1) n=3 and 2) n=4. Assume six first tier co channel cells & mobile unit is at the center of cell. 10

b] Explain principle of Rake receiver in detail. 10

Q3.

a] An urban area has a population of two million residents. Three competing trunked mobile networks (systems A, B and C) provide cellular service in this area. System A has 394 cells with 19 channels each. System B has 98 cells with 57 channels each; and system C has 49 cells each with 100 channels. Find the number of users that can be supported at 2% blocking if each user averages two calls per hour at an average call duration of 3 minutes. Assuming that all three trunked systems are operating at maximum capacity, compute the percentage market penetration of each cellular service provider. Data: GOS = 0.02;

[TURN OVER

Number Of Channels	Total Traffic Intensity (Erlangs)
57	45
19	12
100	88

10

b] Explain W-CDMA Forward channel structure in detail. 10

Q4.

a) Compare IS-95, WCDMA and CDMA2000 with respect to Channel bandwidth, chip rate, modulation schemes, data rates and frame size. 10

b) Draw LTE network architecture and discuss it in detail 10

Q5

a) What is the concept of software defined radio? Elaborate in detail. 10

b) Explain Hand off in UMTS. 10

Q6. Write a short note on **any two** of the following: 20

1. Multiantenna Techniques
2. Cellular capacity and coverage improvement Techniques
3. Indoor propagation Models