Q. P. Code: 36605

(3 Hours)   [Total marks: 80]

Note:

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

Q.1
                                                                        (20)

a. What is near far problem in CDMA how to overcome it?
b. Explain call procedure in GSM for network to mobile terminated call.
c. What is node B, explain its responsibilities.
d. What are the factors influencing Small scale fading?
e. If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (a) four-cell reuse, (b) seven-cell reuse, and (c) 12-cell reuse.

Q.2   (20)

a. Sketch UMTS Network Architecture and explain it in detail.
b. Compare IS95, WCDMA and CDMA2000.

Q.3   (20)

a. Describe algorithms used for authentication & security in GSM with diagrams.
b. Draw reference architecture in GPRS and explain role of GGSN and SGSN.

Q.4   (20)

a. Explain the use of two ray Model to explain Mobile Radio Path Loss and Antenna Height Effects?
b. Consider a cellular system in which total available voice channels to handle the traffic are 960. The area of each cell is $6 Km^2$ and the total coverage area of the system is 2000KM2. Calculate
1) The system capacity if the cluster size, N=4
2) The system capacity if the cluster size, N=7
How many times would a cluster of size 4 have to be replicated to cover the entire cellular area? Does decreasing the reuse factor N increase the system capacity? Justify your answer.

Q.5   (20)

a. How RAKE receiver improves S/N ratio in CDMA also explain why power control on the reverse channel is essential?

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b. A Base station has a 900 MHz transmitter and a vehicle is moving at the speed of 50 kmph. Compute the received carrier frequency if the vehicle is moving: (i) Directly towards the BS, (ii) Directly away from the BS, (iii) In a direction that is 60° to the direction of arrival of the transmitted signal?

Q.6 (20)

a. Describe the concept of software defined radio, Explain it in detail.

b. Sketch and Explain LTE network architecture and various interfaces.

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