53 (EC 615) MBCM

2016

MOBILE COMMUNICATION

Paper : EC 615

Full Marks : 100

Time : Three hours

**The figures in the margin indicate
full marks for the questions.**

*Answer **any five** questions.*

1. (a) State the advantages of Cellular Communication. Why hexagonal shape of a cell is preferred over rectangular or circular shape ? In a hexagonal cellular system, if the distance between two co channel cells is D and cell radius is R, prove that

$$D/R = \sqrt{3N},$$ where N is cluster size. 3+4+5

(b) What are the different multiple access techniques ? Discuss briefly. 8

2. (a) What is co channel cell interference ? Show that in a worst case scenario signal to co-channel interference ratio is $17 \cdot 35dB$.   10

    (b) Derive the relation of transmitter power and received power when in between medium is water and explain different components of the expression.   10

3. (a) Define different channel parameters and describe how they contribute on different types of fading.   14

    (b) Calculate the mean excess delay, rms delay spread, and the maximum excess delay ($10dB$) for the multipath profile given in the figure below. Estimate 50% coherence bandwidth of the channel. Would this channel be suitable for AMPS or GSM service without the use of equalizer ?   6
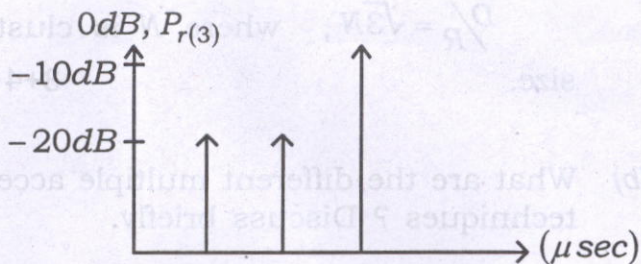
4. *(a)* Discuss channel allocation mechanism in AMPS cellular system in a 7 cell cluster and 3 sectors in each cell. How this mechanism changes in GSM ?

10

(b) Discuss different types of handoff mechanism in cellular communication.

10

5. *(a)* Describe the difference between multiplexing and multiple access. Explain the frame structure of GSM.

3+7

(b) Draw neat block diagram of GSM architecture and explain all the different parts.   10

6. *(a)* What is a PN sequence ? Explain different properties of PN sequence.

10

(b) Describe how an *n* bit maximal length can be generated using stack of flip flop.   10

7. Write short notes on : *(any two)*   10×2

   (1) Diversity Receiver

   (2) Decision feedback equalizer

   (3) Multi Access interference in CDMA

   (4) Fading.

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