53 (EC 615) MBCM

2014

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 practical limitations of wireless communication compared to wired communication.   4

   (b) What is co channel interference ? In hexagonal cellular system show that $D/R = \sqrt{3N}$ where D is distance between two co channel cell and R is the radius of a cell.   6

   (c) Show that in worst case scenario, in a hexagonal cellular system, signal to co channel interference ratio $=17 \cdot 35dB$.   10

2. *(a)* Derive relation between Transmitted power and Received Power using isotropic radiator and in free space condition. State briefly how does it changes from location to locations where it is not free space. 8

(b) Define the following channel parameters

(a) Coherence Bandwidth

(b) Coherence time

(c) Doppler spread and

(d) Mean excess delay. 6

(c) State how the channel parameters lead to fading and classify fading depending on the relations between channel parameters.

6

3. *(a)* State how the effect of fading can be reduced. State the working principle of LMS equalizer to find out optimum channel parameter. 3+9

(b) What is concept of diversity receptions ? Derive the expression of average SNR in selection diversity and show that

$$\frac{\overline{Y}}{J} = \sum_{K=1}^{M} \frac{1}{K}$$

where J is average SNR and $\overline{Y}$ is mean SNR and M is no. of diversity branches.　　8

4.　*(a)* What is sectorization of a cell ? State how channel allocation is done in AMPS cellular system. What are differences between set up channel, voice channel and control channel ?

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　(b) Draw the neat block diagram of GSM architecture and show different interfaces.

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5.　*(a)* What is meant by spread spectrum ? State how it helps to avoid jamming signal ? Provide necessary mathematical explanation.

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　(b) What is multi access interference in CDMA system ? Derive it's mathematical expression.

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6. *(a)* Which digital modulation technique is popularly used in GSM system ? Draw the block diagram and explain it's working.

10

(b) What is GPRS ? Draw the block diagram of a GSM system where GPRS service is provided. Give the different features and constraints of GPRS system.

10

7. Write short notes on : *(any two)*   10×2=20

(a) Non co channel Interference

(b) Cell splitting

(c) Hand off

(d) GSM frame structure.