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53 (EC 615) MBCM

2012C

2013

(May)

## MOBILE COMMUNICATION

Paper : EC 615

Full Marks : 100

Pass Marks : 30

Time : Three hours

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

*Answer any five questions.*

- (a) State the utility of cellular communication. Why hexagonal cell is adopted in cellular communication system? Show that in a hexagonal cellular system Frequency Reuse Ratio is  $D/R = \sqrt{3N}$  where  $D$  is the distance between two cochannel cells and  $R$  is cell radius and cluster size is  $N$ . 10

(b) What are the different types of Multiple Access Techniques? Describe briefly. 10

*Contd.*

2. What are the different channel parameters? Define them. Depending on different channel conditions how fading can be classified? Discuss briefly. 20
3. (a) What is meant by cochannel interference? Show that in a hexagonal cellular system worst case signal to co-channel interference ratio is  $17.35\text{ dB}$ . 10
- (b) Derive the relation of transmitter power and received power when in-between medium is land and explain different components of the expression. 10
4. (a) What is the utility of an equalizer? Derive the expression of average mean square error in an adaptive equalizer. 10
- (b) What is meant by space diversity? How it is popular compared to time and frequency diversity? Describe selection diversity and its advantages. 10
5. (a) How channel numbering and grouping is done in AMPS cellular system? What is the difference between voice channel, setup channel and access channel? 10

- (b) Draw block diagram of GSM architecture and briefly explain function of Network switching sub-system and operation sub-system. 10
6. (a) What is meant by spread spectrum? Describe how it avoids Jamming? Explain with necessary mathematical explanation. 10
- (b) What is multi access interference in CDMA system? Derive the expression of average MAI power for a CDMA system. 10
7. Write short notes : (*any two*) 2×10
- (a) Hand off
- (b) Cell splitting
- (c) Non cochannel interference
- (d) GPRS.