

BT-8/M12

## WIRELESS AND MOBILE COMMUNICATION

Paper-ECE-402-E

Time allowed : 3 hours]

[Maximum marks : 100

Note : Attempt five questions in all selecting at least one question from each of the four units.

## Unit-I

1. (a) What is fading ? Show typical slow and fast fading in an urban mobile environment. 5

(b) What is Okumara model ? Mention its major advantages and disadvantages. 5

(c) In free space, the received power at a reference distance  $d_0 = 1$  km is equal to 1 microwatt. Find the received power at a distance of 2 km.

Assume  $f = 1800$  MHz,  $h_t = 40$  m,  $h_r = 3$  m,  $G_t = G_r = 0$  dB.

Symbols used carry usual meanings. 10

2. (a) Discuss Jake's channel model in detail. 10

(b) In a Ricean fading channel, median RSSI is  $-70$  dBm. Calculate the availability of a signal greater than  $-80$  dBm for  $k = 10$  dB. Assume the data, if necessary. 10

**Unit-II**

3. (a) What are linear and non-linear modulation techniques ? Explain with examples. 5
- (b) Mention important properties of MSK. Define MSK signal for an N-bit stream. 8
- (c) Briefly explain the concept of RAKE demodulation. 7
4. (a) Explain correlation property of PN sequence. 5
- (b) An FHSS system employs a total bandwidth of 400 MHz and individual channel bandwidth of 100 Hz. Determine the minimum number of PN bits required for each frequency hop. 8
- (c) What is gold sequence ? Explain in brief. 7

**Unit-III**

5. (a) Why hexagonal geometry is preferred for the analysis of cellular systems ? 7
- (b) An analog cellular system has a total bandwidth of 33 MHz and uses two 25 kHz simplex channels to provide full duplex voice and control channels. Find the number of channels available per cell for a frequency reuse factor of 7. 7
- (c) Write a short note on soft capacity. 6



6. (a) What are different channel allocation schemes ?  
Discuss those. 10
- (b) What is the need of handover in cellular systems ? Discuss different handover techniques. 10

#### Unit-IV

7. (a) What do you understand by mobility management ? How will you perform this ?  
Explain. 10
- (b) Give the block schematic of the GSM architecture and discuss it. 10
8. Write short notes on the following :
- (a) IS-95 channel structure 10
- (b) IMT-2000 10