Roll No. ..... Total No. of Pages : 3

BT-8/JX 9531

Wireless and Mobile Communication

Paper : ECE-402 E

Time : Three Hours] [Maximum Marks : 100

Note :– Candidates has to attempt **FIVE** questions in all, selecting at least **ONE** question from each Section.

SECTION–I

1. (a) (i) Explain the propagation of signal in outdoor using Hata Model.

(ii) Explain how the diffraction affects the signal propagation using knife edge diffraction model.

(b) Explain two ray ground reflection propagation model used in a mobile radio channel.

2. (a) If the received power at a reference distance d_0 = 1 Km is equal to 1 microwatt, find the received powers at distances of 2 Km and 10 Km from the same transmitter for the following path loss models: Free space, n =3, n=4 and two ray ground reflection using the exact expression. Assume f = 1800 Mhz, h_t = 40 m, h_r = 3 m, G_t = G_r = 0dB.

(b) What are the types of small scale fading ? Explain each of the fading effects in detail.

SECTION–II

3. (a) What is meant by Quadrature phase shift keying ? Write in detail about the transmission and detection of pi/4 QPSK signals with block diagrams.

(b) Explain the time diversity techniques of DSSS and the RAKE receiver.

4. (a) Explain the space diversity reception methods in detail with neat diagrams.

(b) Illustrate Frequency Hopping Spread Spectrum and Direct Sequence Spread Spectrum with suitable examples.

SECTION–III

5. (a) For a N = 7 system with Pr[Blocking] = 1% and average call length of 2 minutes, find the traffic capacity loss due to trunking for 57 channels when going from omnidirectional antennas to 60 degree sectored antennas. (Assume that blocked calls are cleared and the average per user call rate is λ =1 per hour).

(b) Discuss what are the problems encountered in implementing handoff strategy and how they are resolved ?

6. (a) With neat diagram explain frequency reuse concept. Justify system capacity increases by frequency reuse with necessary mathematical equations.

(b) Assume each user of single base station mobile radio system averages three calls per hour, each call lasting an average of five minutes :

(i) What is the traffic intensity for each user ?

(ii) Find the number of users that could use the system with 1% blocking if only one channel is available.

SECTION–IV

7. (a) Explain the GSM services and the reference architecture of GSM cellular networks.

   (b) Explain the IS-95 CDMA forward channel in detail.

8. (a) Discuss the radio aspects of IMT-2000.

   (b) Write short notes on :

   (i) Call control

   (ii) Mobility management

   (iii) Location tracing.