B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

00667

Term-End Examination

June, 2014

BIEL-018 : WIRELESS COMMUNICATION

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt any **seven** questions out of the ten questions. All questions carry equal marks. Missing data may be suitably assumed.*

1. (a) If a transmitter produces 50 W of power, express the transmitted power in units of (i) dBm and (ii) dBW. If 50 W is applied to a unity gain antenna with a 900 MHz carrier frequency, find the received power in dBm at a free space distance of 100 m from the antenna. What is Pr(10 km) ? Assume unity gain for the receiver antenna.   *5*

    (b) Differentiate frequency selective versus flat fading and fast versus slow fading.   *5*

2. (a) Discuss the factors which affect multipath fading. *5*

(b) Calculate the mean excess delay, rms delay spread and the maximum excess delay (10 dB) for the multipath profile given in the figure below. Estimate the 50% coherence bandwidth of the channel. *5*
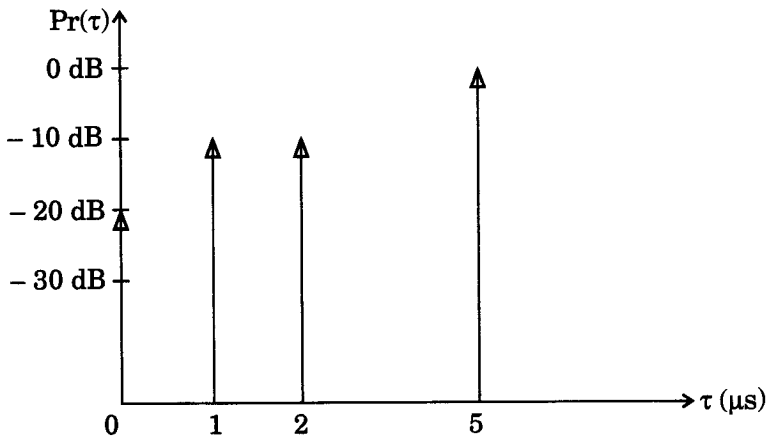
3. (a) Draw the block diagram of DS-SS transmitter with binary phase modulation. *5*

(b) If 63 users share a CDMA system and each user has a processing gain of 511, determine the average probability of error for each user. What assumptions have you made in determining your result ? Give your answer in terms of Q function. *5*

4. (a) Explain the function of RAKE Receiver with neat sketch. *5*

(b) Explain the MRC diversity scheme. *5*

5. (a) Explain the Channel Vocoder. 5

(b) Explain the different LPC excitation methods. 5

6. (a) The GSM TDMA system uses a 270·833 kbps data rate to support eight users per frame. (i) What is the raw data rate provided for each user ? (ii) If guard time, ramp-up time and synchronization bits occupy 10·1 kbps, determine the traffic efficiency for each user. 5

(b) How is multiple data received in TDMA technique ? 5

7. (a) Explain Frequency reuse technique. 5

(b) Explain the MAHO technique. 5

8. (a) If a signal to interference ratio of 15 dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (i) $\eta = 4$ (ii) $\eta = 3$? Assume that there are six cochannel cells in the first tier and all of them are at the same distance from the mobile. Use suitable approximations. 5

(b) What is adjacent channel interference ? How can it be minimized ? 5

9. Explain the two technologies used in mobile communication : *5+5*

  (a) GPRS

  (b) EDGE

10. Write short notes on the following : *5+5*

  (a) Bluetooth

  (b) CDMA 2000

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