(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2485   Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

B.Tech.
(SEMESTER-VI) THEORY EXAMINATION 2012-13
WIRELESS COMMUNICATION

Time : 2 Hours]   *[Total Marks : 50*

SECTION – A

1. Attempt **any five** parts : $5 \times 2 = 10$

   (a) Classify the various types of fading.

   (b) Define diffraction.

   (c) What is meant by Rake receiver ?

   (d) What are techniques available in spread spectrum modulation ?

   (e) Find the frequency reuse factor if $i = 2$ and $j = 3$.

   (f) If the number of channels in a cell is 20, 7 cells per cluster and overall 100 clusters. Find the total capacity of the network.

   (g) If in AMPS, Cellular operator is allocated 12.5 MHz, B_{guard} is 10 KHz, find the number of channels available in an FDMA system.

   (h) The minimum bandwidth required for PAM/TDM system is 300 kHz and the number of channels to be transmitted is 20. Find the bandwidth of each channel.

   (i) Calculate the number of bits required in PCM to have a signal to quantization ratio of about 40dB.

   (j) If $W = 2.15$ MHz, $R = 9600$ bps and minimum acceptable Eb/No is 5dB, determine the maximum number of users that can be supported in a single cell CDMA system.

SECTION – B

2. Attempt any **three** question parts : $5 \times 3 = 15$

   (a) Compare a wireless LAN to a wired LAN on the parameters of physical devices used, standards, regulation, range and security.

   (b) Explain the working of direct sequence spread spectrum (DS-SS) with the help of block diagram.

   (c) With the help of block diagram, explain the working of linear predictive coder scheme.

   (d) Given a Cellular system in which there are a total of 1001 radio channels available for handling traffic. It is also given that the area of a cell is 6 km and the entire system is 2100 Km^2.

       (i) Calculate the system capacity if the cluster size is 7.

       (ii) How many times would the cluster of size 4 have to be replicated in order to approximately cover the entire cellular area ?

       (iii) Calculate the system capacity if the cluster size is 4.

       (iv) Does decreasing the cluster size increase the system capacity ?

   (e) Draw a cellular system with 19-cell reuse. For this cellular system, calculate the following :

       (i) Distance between co channel cells for unit cell radius.

       (ii) Co-channel reuse ratio

       (iii) Capacity of the system

SECTION – C

Attempt **all** questions : $5 \times 5 = 25$

3. Attempt any **one** part : $5 \times 1 = 5$

   (a) A vehicle receives a 900 MHz transmission while travelling at a constant velocity for 10 s. The average fade duration for a signal level 10 dB below the RMS value is 1 ms. How far does the vehicle travel during the 10s interval ? How many fades does the signal undergo at the rms threshold level during a 10s interval ? Assume that the local mean remains constant during travel.

   (b) Derive the different parameters of mobile multipath channels.

4. Attempt any **one** part : 5 × 1 = 5

    (a) Define RAKE receiver. Explain the working of a M-branch RAKE receiver.

    (b) Explain the working of direct sequence spread spectrum (DS-SS) with the help of block diagram.

5. Attempt any **one** part : 5 × 1 = 5

    (a) Classify the various types of voice coders and explain them.

    (b) Explain the TDMA scheme, its salient features and frame structure. Find expression for the efficiency and number of channels in TDMA system.

6. Attempt any **one** part : 5 × 1 = 5

    (a) Write short note on mobile assisted hand off.

    (b) Explain the concept of frequency Reuse.

7. Attempt any **one** part : 5 × 1 = 5

    (a) What is PN sequence ? Where is it used ? Mention its advantages.

    (b) With the help of block diagram, explain the working of linear predictive coder scheme.