

Printed Pages : 3

EEC028

(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 × 2 = 10

- Classify the various types of fading.
- Define diffraction.
- What is meant by Rake receiver ?
- What are techniques available in spread spectrum modulation ?
- Find the frequency reuse factor if  $i = 2$  and  $j = 3$ .
- 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.
- If in AMPS, Cellular operator is allocated 12.5 MHz,  $B_{\text{guard}}$  is 10 KHz, find the number of channels available in an FDMA system.
- 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.
- Calculate the number of bits required in PCM to have a signal to quantization ratio of about 40dB.
- If  $W = 2.15$  MHz,  $R = 9600$  bps and minimum acceptable  $E_b/N_0$  is 5dB, determine the maximum number of users that can be supported in a single cell CDMA system.

2485



2485

1

P.T.O.

**SECTION – B**2. Attempt any **three** question parts :**5 × 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<sup>2</sup>.
  - (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 × 5 = 25**3. Attempt any **one** part :**5 × 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.
-