

Printed pages: 02

Sub Code: NEN-022

Paper Id:

121618

Roll No:

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B.TECH
(SEM. VI) THEORY EXAMINATION 2017-18
WIRELESS COMMUNICATION

Time: 3 Hours**Total Marks: 100**

- Note:** 1. Attempt all Sections.
 2. Assume any missing data.

SECTION A

- 1. Attempt all questions in brief. 2 x 10 = 20**
- a. Define diffraction.
 - b. Classify the various types of fading.
 - c. Explain the term reflection & scattering.
 - d. Compare fast fading & slow fading.
 - e. What is Rake receiver?
 - f. Discuss briefly FDMA
 - g. What is the principle behind FHSS.
 - h. 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.
 - i. Find the frequency reuse factor if $i = 2$ and $j = 3$.
 - j. If a cellular operator is located 10MHz for each simplex band and if B_t is 10 MHz B_{guard} is 10KHz and B_c is 30 KHz find the number of channel available in FDMA system.

SECTION B

- 2. Attempt any three of the following: 10 x 3 = 30**
- a. What are the types of small scale fading? Explain flat fading and frequency selective fading in detail. Draw the channel characteristics for flat fading channel & frequency selective channel.
 - b. Draw the basic block diagram of Frequency Hopping Spread Spectrum (FH-SS) system. Explain the performance analysis of FH-SS system.
 - c. Explain the TDMA scheme, its salient features and frame structure. Find expression for the efficiency and number of channels in TDMA system.
 - d. What is the capacity in cellular system? 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
 - e. Discuss handoff in cellular networks. Explain different types of handoff strategies.

SECTION C

- 3. Attempt any one parts of the following: 10 x 1 = 10**
- a. Explain practical link budget design using free space propagation model in detail.
 - b. What is multi path fading? Explain multi path shape factor for fading wireless channels in detail.

4. Attempt any one parts of the following: 10 x 1 = 10

- a) What is equalizer in communication receiver? What are equalization techniques used in communication?
- b) Explain spread spectrum technology in detail. Compare it with narrow band.

5. Attempt any one parts of the following: 10 x 1 = 10

- a) Describe in detail about the space diversity techniques.
- b) With the help of block diagram, explain the working of linear predictive coder scheme in detail.

6. Attempt any one parts of the following: 10 x 1 = 10

- a) Explain SDMA in detail. Compare TDMA and SDMA according to various characteristics.
- b) What is frequency Reuse? How this is used in GSM cellular network? Explain Channel Assignment strategies.

7. Attempt any one parts of the following: 10 x 1 = 10

- a) Discuss the techniques used to improve coverage & capacity in cellular system in detail.
- b) The coverage area of a cellular system is 2000 sq km with each cell having a radius of 5 sq km, and there are a total of 1000 radio channels available for handling the traffic.
 - i. Calculate the system capacity for 7-cell reuse.
 - ii. If $N = 7$, how many times the cluster has to be replicated in order to approximately cover the entire cellular area? Calculate the system capacity for the given case.
 - iii. Does decreasing the cluster size increase the system capacity? Explain