

B.TECH
(SEM. VIII) THEORY EXAMINATION 2017-18
WIRELESS & MOBILE 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. Differentiate hard and soft handoff?
 - b. What is channel assignment? What are the types?
 - c. State some applications of spread spectrum modulation.
 - d. Define diversity?
 - e. Find the number of duplex channels, if 20MHz of total spectrum is allocated for a duplex wireless cellular system and each simplex channel has 25 KHz RF bandwidth.
 - f. Write short note on OFDMA?
 - g. Write range of frequency for forward and reverse link operation for IS-95.
 - h. What are the services offered by GSM?
 - i. How IMT-2000 is useful for node to node communication?
 - j. What is WiMax?

SECTION B

- 2. Attempt any three of the following: 10 x 3 = 30**
- a. What do you understand by coverage and capacity in cellular systems? Name the techniques used to increase the capacity of a cellular system and compare them.
 - b. With the help of block diagram and suitable expressions explain the generation and reception of direct sequence spread spectrum (DS-SS) signal using BPSK modulation.
 - c. Define the term ALOHA. Explain Pure and Slotted ALOHA.
 - d. Draw and explain the component of mobile network structure of IMT-2000.
 - e. Explain 4G technologies in detail and also compare it with 1G, 2G and 3G technology.

SECTION C

- 3. Attempt any one parts of the following: 10 x 1 = 10**
- a. Discuss various types of small scale fading based on multipath time delay spread. Distinguish between flat fading and frequency selective fading.
 - b. What are the limitations of mobile telephone systems? Verify the cluster size $N = i^2 + j^2 + ij$, where i and j are the integers used to determine the co-channel cells.
- 4. Attempt any one parts of the following: 10 x 1 = 10**
- a) What is PN sequence? Draw suitable PN sequence generator and prove the properties of PN sequence.
 - b) Derive an expression for selection diversity improvement in terms of probability of receiving signal using single branch or using M branches.

5. Attempt any one parts of the following:

10 x 1 = 10

- a) Explain the structure of RAKE receiver with the help of neat diagram. What is m branch RAKE receiver?
- b) Explain SC-FDMA, IDMA schemes and hybrid method of multiple access schemes.

6. Attempt any one parts of the following:

10 x 1 = 10

- a) Explain signal processing and GSM operations from speech input to speech output with diagram. Calculate the total available channels for a cellular system having a total bandwidth of 60 MHz which uses two 50 KHz simplex channel to provide full duplex voice and control channels. Assume that the system uses nine cell reuse pattern and 1 MHz of the total bandwidth is allocated for control channels. Also calculate the number of control channels and voice channels per cell.
- b) How does CDMA technology works? Give detailed features of GSM and CDMA mobile standards.

7. Attempt any one parts of the following:

10 x 1 = 10

- a) What do you understand by Mobile Data Network? Explain important features of mobile Ad-Hoc networks.
- b) Discuss a complete model of Next Generation Network (NGN) systems for mobile communication. How it is useful for network security?