

**Eighth Semester B. Tech. Degree Examination, May 2017**

**(2013 Scheme)**

**13.804 WIRELESS COMMUNICATION**

Time:3 Hours

Max.Marks:100

**PART – A**

Answer: **All** Questions.

1. Briefly explain about paging and cordless wireless systems.
2. Differentiate wireless local loop and wireless local area network.
3. Explain about the prominence hand off strategies in mobile communication.
4. Discuss the techniques for improving coverage and capacity in cellular systems.
5. If a particular FDD cellular telephone system has a total bandwidth of 33 MHz, and if the phone system uses two 50 KHz simplex channels to provide full duplex voice and Control channels. Compute the number of channels per cell if  $N = 4, 7$ ,
6. Define CSI.
7. Write the advantages of geostationary satellite.
8. Describe about wireless networking.
9. Discuss about the principle behind OFDM.
10. Define the terms Trunking and Grade of Service.

(10\*2=20Marks)

**PART-B**

Answer **any one** question from **each module**. Each question carries **20 marks**.

**Module I**

- 11.(a) Describe the model and characteristics of a wireless channel deriving the impulse response of the channel (7 Marks)
- (b) Discuss Bluetooth standard. (3 Marks)
- (c) Explain about various generations in cellular network. (10 Marks)

Or

12. Describe the WIMAX technologies its architecture and spectrum allocation.

(20 Marks)

## Module II

13. (a) Explain with timing diagram how a call is being made from the PSTN to a mobile user. (10 Marks)
- (b) Explain the different physical and control channels in GSM. Draw and explain the Frame format for GSM. (10 Marks)

OR

- 14.(a) Explain in detail about the cellular system design fundamentals. (15 Marks)
- (b) If a signal to interference ratio is 30 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  $n=4$ . Assume there are 12 co channel cells in first tier and all of them are at the same distance from mobile. (5 Marks)

## Module III

15. (a). What is the need for diversity? List different types of diversity techniques. (7 Marks)
- (b). Explain the model of MIMO systems. Derive the capacity of a MIMO channel. (13 Marks)

OR

16. (a) Explain the ground reflection two ray models.
- (b) A mobile is located 5 km away from a base station and uses a vertical  $\lambda/4$  monopole antenna with gain 2.55db to receive cellular radio signals. The E- field at 1 km from the transmitter is measured to be  $10^{-3}$  V/m. The carrier frequency used for the system is 900MHz.
- (i) Find the length and the effective aperture of the receiving antenna.
- (ii) Find the received power at the mobile using the two ray ground reflection model assuming the height of the transmitting antenna is 50m and the receiving antenna is 1.5m above ground. (20 Marks)

## Module IV

- 17.(a) What are the major differences between TDMA, FDMA and CDMA? Explain in detail about each multiple access. (15 Marks)
- (b). Discuss about UMTS, EDGE, and GPRS. (5 Marks)

OR

- 18.(a) List the main components of earth station transmitter. Briefly explain with block diagram its functions of operation. (13 Marks)
- (b). Explain about geostationary satellite and GPS system (7 Marks)
- (20\*4=80 Marks)