

Question Paper Code : X10370

B.E/B.Tech. DEGREE EXAMINATIONS APRIL / MAY 2021

Sixth semester

Electronics and Communication Engineering

EC8652- WIRELESS COMMUNICATION

Common to: (Computer and Communication Engineering / Electronics and Telecommunication Engineering)

(Regulations 2017)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART- A (10 x 2 = 20 Marks)

1. State the condition for the occurrence of Flat and Frequency Selective Fading
2. Define Coherence Time and Coherence Bandwidth
3. Write down the procedure involved in the determination of Co-Channel Cell
4. Define frequency reuse
5. Why GMSK is used in Cellular communication
6. How OFDM differ from FDM
7. List out the factors that influence the performance of adaptive equalization algorithms
8. Assume 5 branch diversity is used, where each branch receives an independent Rayleigh fading signal . If the average SNR is 20 dB, determine the probability that the SNR will drop below 10 dB.
9. Compute the capacity of the channel with SNR 10 dB
10. What is the purpose of usage of Beam forming in MIMO system

PART- B (5 x 13 = 65 Marks)

11. a) (i) Derive the received power in dBm for a free space Propagation model (10)
(ii) Determine the Fraunhofer distance for an antenna with maximum dimension of 1 m and operating frequency of 900 MHz. If the antennas have unity gain calculate the path loss (03)

OR

- b) Discuss the impact of time dispersion parameter, Coherence Bandwidth , Doppler Spread and Coherence time on small scale fading (13)
12. a) (i) Discuss your understanding on various multiple access techniques namely FDMA, TDMA and CDMA (06)
(ii) Highlight their advantage, disadvantage and uses in cellular communication (07)

OR

- b) (i) Explain with neat sketch, Handoff mechanism adopted in cellular communication detailing the condition for proper handoff (07)
(ii) Highlight the significance of prioritizing Handoffs and Practical Handoff consideration (06)
13. a) (i) "OFDM is more popularly used in advanced wireless communication" – Justify with proper explanation detailing the working Principle, cyclic prefix, implementation structure (07)
(ii) State the significance of windowing and PAPR (06)
- OR**
- b) (i) Explain the working mechanism of transmitter and receiver block of MSK modulation technique (10)
(ii) State the salient features observed in the power spectral density of MSK when compared with QPSK and OQPSK (03)
14. a) (i) Write short notes on zero forcing and LMS algorithm (10)
(ii) Draw the Block diagram of simplified communication system using an adaptive equalizer at the receiver (03)
- OR**
- b) (i) Discuss about any two receiver diversity technique (10)
(ii) Draw the structure of Rake Receiver (03)
15. a) (i) Discuss a 2 x 2 MIMO system and provide your understanding on Alamouti Code (10)
(ii) Write short notes on spatial multiplexing (03)
- OR**
- b) (i) Mention the importance of channel state information (07)
(ii) How MIMO creates performance gains in a fading channel (06)

PART- C (1 x 15 = 15 Marks)

16. a) With neat sketch explain and derive the received power for a two ray ground reflection model
- OR**
- b) Analyze the impact of both co-channel and adjacent channel interference on system capacity in a cellular system