SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
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QUESTION BANK (DESCRIPTIVE)

Subject with Code :WC(16EC3809) **Course & Branch**: M.Tech - DECS

Year & Sem: I-M.Tech & II-Sem

UNIT – I

1. a) With the help of a diagram, explain Cellular telephone system. [6M]
   b) Discuss the Paging System. [4M]
2. a) Write about the evolution of Mobile Radio Communication Systems in detail. [6M]
   b) Explain WLL. [4M]
3. Give the details about the following types of 2G and 2.5G mobile communications in detail.
   a) GSM [5M]
   b) TDMA [5M]
4. What is 3G mobile communications? Give the details about the following types of 3G.
   a) UMTS [5M]
   b) TD-SCDMA [5M]
5. Write about a) CDMA [5M]
   b) GPRS [5M]
6. a) Explain CDMA 2000 1x EV. [4M]
   b) Give the comparison of different wireless communication systems. [6M]
7. a) Explain Bluetooth Technology. [5M]
   b) Write about Personal Area Networks. [5M]
8. a) Explain in detail Cordless Telephone with the help of neat diagrams. [5M]
   b) Give the comparison of 2G cellular networks. [5M]
9. a) Explain the terms i) Simplex ii) Half duplex and iii) Full Duplex [5M]
   b) Give the evolution of 2G Cellular standards. [5M]
10. Explain in detail examples of wireless communication systems. [10M]

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UNIT –II

1. a) Explain the Free space propagation model? [4M]
   b) Explain three different propagation mechanisms. [6M]
2. a) What is Reflection? Explain in detail the reflection from dielectric and conductors. [6M]
   b) Define Diffraction and Scattering. [4M]
3. a) Explain in detail the indoor & outdoor propagation model. [6M]
   b) Write short notes on small scale fading. [4M]
4. a) Explain in detail the small scale multipath propagation and its different Measurements. [4M]
   b) Discuss Rayliegh & Ricean distributions. [6M]
5. Explain the terms
   a) Fresnel Zone geometry [5M]
   b) Knife edge diffraction model [5M]
6. a) Give the basic classification of Small Scale fading. [5M]
   b) Explain the types of small scale fading based on multipath time delay spread. [5M]
7. a) Explain fading effects due to Doppler spread. [5M]
   b) Discuss Flat fading and Frequency selective fading. [5M]
8. a) Describe the statistical models of radio propagation. [5M]
   b) Design the simulation methods of these models. [5M]
9. If a transmitter produces 50W of power, express the transmit power in units of (A) dBm and dBW. If 50W is applied to a unity gain antenna with a 900MHz carrier frequency, find the received power in dBm at a free space distance of 100m from the antenna. Determine P_r (10Km)? Assume unity gain for the receiver antenna. [10M]
10. a) Derive the expression for received power for Two-ray model. [7M]
    b) Define the following: [3M]
    i) Fraunhofer region ii) Fading iii) Path Loss

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UNIT –III

1. Explain following diversity techniques in detail.
   a) Maximal ratio Combiner [5M]
   b) Scanning Diversity [5M]
2. Derive the expression for Maximal Ratio Combining Improvement. [10M]
3. a) Explain the concept of diversity branches and signal paths. [5M]
   b) Write short notes on Selective Diversity combining. [5M]
4. a) Compare FDMA and TDMA Techniques. [5M]
   b) Explain the terms: i) Handover Process and ii) Co-channel Interference [5M]
5. If a signal to interference ratio of 15 dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be use for maximum capacity if the path loss exponent is a) n = 4 b) n= 3? Assume that there are 6 co-channels cells in the first tier and all of them are at the same distance from the mobile, use suitable approximations. [10M]
6. Explain following diversity techniques in detail.
   a) Maximal ratio combining [5M]
   b) Selective diversity combining [5M]
7. a) What is frequency reuse concept? Discuss about this concept for N=4 and N=7. [5M]
   b) Explain FDM and TDM and give their advantages and disadvantages. [5M]
8. a) What is grade of Service? Explain the Erlang Capacity Analysis. [5M]
   b) What is Spatial Reuse Concept? Give its advantages. [5M]
9. a) Explain the Techniques involved in Improving cellular capacity and explain any one in detail. [5M]
   b) What is Diversity? And explain different types of Diversity Techniques. [5M]
10. Write about various types of Handoff processes available briefly. [10M]

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UNIT –IV

1. a) Write short notes on spread spectrum- Frequency Hopping systems. [4M]
   b) Explain in detail Time Hopping and Anti – Jamming. [6M]

2. a) What is CDMA? Explain about the capacity of a cellular CDMA network. [5M]
   b) Explain in detail Spread Spectrum Multiple Access and also mention its advantages and disadvantages. [5M]
3. a) Define Hand off Process and explain its strategies. [6M]
   b) What do you mean by Reverse link power control? [4M]

4. a) Explain in detail the CDMA multiple access technique. [5M]
   b) Summarize the CDMA working principle. [5M]

5. What is Pseudo Random (PN) sequence and explain how it is used in Wireless Communication. [10M]
6. Explain in detail a) Gold sequences [5M]
   b) Maximal length sequences [5M]

7. What is RAKE Receiver? Explain it with the help of neat diagram in detail. [10M]

8. Explain Interference Analysis for Broadcast and Multiple Access Channels. [10M]

9. a) Explain Direct sequence spread spectrum. [5M]
   b) Differentiate Hard and Soft hand off strategies. [5M]
10. a) Give the performance analysis of a Rake Receiver. [5M]
    b) Differentiate CDMA with FDMA. [5M]

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UNIT –V

1. a) Define Fading. And also explain the concept of Capacity of flat and frequency selective fading channels. [5M]

   b) What is MIMO? Explain the parallel decomposition of MIMO channels. [5M]

2. a) Define Air interface and give its specifications. [4M]

   b) Explain about the following communication standards [6M]

   i) UMTS ii) GSM

3. What is 3G mobile communications? Give the details about the following types of 3G mobiles.

   a) UMTS [5M]

   b) TD-SCDMA [5M]

4. Give the details about a) CDMA 2000 1x EV [5M]

   b) IS- 95 CDMA [5M]

5. a) Explain types of Static Channels in MIMO Channel Capacity. [5M]

   b) With the help of figures, explain Narrow Band MIMO Model. [5M]

6. a) Explain the concept of Capacity of flat and frequency selective fading channels. [6M]

   b) Write short notes on TD-SCDMA [4M]

7. Give the details about the following types of 2G and 2.5G mobile communications in detail.

   a) GSM [5M]

   b) FDMA [5M]

8. Explain Different Cellular Wireless Communication Standards. [5M]

9. Give the analysis of

   a) Capacity of Wireless Channels. [5M]

   b) Capacity of flat and frequency selective fading channels. [5M]

10. Explain the following:

    a) CDMA 2000 standards and specifications. [5M]

    b) GSM specifications [5M]

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