Total No. of Questions : 8] *[Total No. of Printed Pages :2*

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MEDC-205

M.E./M.Tech., II Semester

Examination, June 2013

Mobile & Satellite Communication

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Explain the concept of frequency reuse. What is frequency reuse distance and permissible cluster size?
   b) Explain the types of handoff strategies used in cellular communication.

2. a) A cellular system uses a frequency reuse factor $N = 4(i = 0, j = 2)$. If the path loss exponent $\gamma=4$ and cell radius R = 5 km, find the following in dB.
      i) Signal to interference ratio (SIR) with no cell sectoring
      ii) SIR with 120° cell sectoring
      iii) SIR with 60° cell sectoring
      Comment on the results.
   b) Explain what is trunking efficiency and GOS? State the Erleng - B and Erleng C formula for Blocked cells cleared and blocked cells delayed system.

3. a) Explain the following speech coding methods waveform coding.
      Source coding, Hybrid coding
   b) Assuming the speed of a vehicle to be equal to 60m/hr, carrier frequency fc = 800 MHz and rms delay spread = 2 us. Calculate coherence time and coherence bandwidth. At a coded symbol rate of 19.2 kbps what kind of symbol distortion will be experienced? What type of fading will be experienced by the channel?

4. a) What is spread spectrum modulation? List its advantages and disadvantages. Explain the main principle of direct sequence spread spectrum modulation.
   b) What is meant by equalization? Explain any one adoptive equalizing algorithm.

5. a) Draw and explain the layered protocol architecture of IEEE 802.11 standard.
   b) What is HIPERLAN-? What were the functional requirements for ETSI-HYPERLAN-1? How does it differ from HIPERLAN-2?

6. What are GEO, MEO, and LEO satellites A certain 6/4 GHz satellite uplink has the following data EIRP = 80dBW
   Earth station satellite distance = 35780 km
   Attenuation due to atmospheric factors = 2dB
   Satellite antenna's aperture efficiency = 0.8
   Satellite antenna's aperture area = $0.5m^2$
   Satellite receiver's effective noise temperature = 190K
   Satellite receiver's bandwidth = 20MHz.
   Determine the link margin for satisfactory quality of service if the threshold value of received carrier-to-noise ratio is 25 dB.

7. What are the parameters used to compare the efficiency of various cellular modulation techniques? What is spectral efficiency? Mention the various methods to improve the spectral efficiency. Also write the equation for spectral efficiency of modulation.

8. Write short notes on the following:
   a) Orthogonal frequency division multiplexing (OFDM)
   b) Wideband CDMA.

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