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Total No. of Pages: 02**Total No. of Questions: 08****M.Tech.(ECE) (Sem.-3rd)****WIRELESS AND MOBILE COMMUNICATION****Subject Code: EC-520****Paper ID: [E0577]****Time: 3 Hrs.****Max. Marks: 100****INSTRUCTIONS TO CANDIDATE:**

1. *Attempt any FIVE questions out of EIGHT questions.*
2. *Each question carry TWENTY marks.*

1.
 - a) Explain the role of transmission media in wireless communication,
 - b) Describe four layers of the TCP/IP protocol suite.
2.
 - a) The choice of antenna directly impacts the performance of Network. What is various design issues need to be considered to select antenna.
 - b) We consider a communication system in which the distance between the transmitter and receiver is 10,000 m. The transmitter EIRP is 30 dBW ($G_T = 20$ dBi; $P_T = 10$ dBW). The transmitting frequency is 1.5 GHz ($\lambda = 0.2$ m). The receiver antenna gain is 3 dBi and total system losses are 6 dB. Assuming the receiver noise figure is 5 dB and bandwidth is 1.25 MHz, calculate the received signal power at the receiver antenna and the SNR of the received signal. Neglect any feed line losses between the antenna and receiver.
3.
 - a) What are the requirements for a DSSS and also distinguish between the DSSS and FHSS systems.
 - b) Consider a FHSS system in which the input data rate is 200 bits per second. The modulation scheme of 32-ary FSK is used to generate the modulation symbol. The frequency hopping rate is 200 hops per second. Calculate
 - (i) Minimum separation between frequency tones
 - (ii) Number of frequency tones produced by a frequency synthesizer
 - (iii) Processing gain
 - (iv) Hopping bandwidth
 Assume a frequency multiplication factor $K=1$.
4. Describe the fundamental characteristics of an uplink, a transponder, and a downlink model for a satellite system.

5.
 - a) Draw and explain the architecture of wireless access protocol.
 - b) The information in an analog waveform with a maximum frequency of 3 kHz is transmitted over an M-ary PCM system, where the number of pulses levels is $M=32$. The quantization distortion is specified not to exceed $\pm 1\%$ of the peak to peak analog signal.
 - (i) What is the minimum number of bits/sample or bits/PCM word that should be used?
 - (ii) What is the minimum sampling rate and what is the resulting transmission rate?
 - (iii) What is the PCM pulse or symbol transmission rate?
6. What are the two network architectures for the WLAN defined in the IEEE 802.11 standard? Discuss them in detail.
7.
 - a) Explain the layering structure used in CDMA.
 - b) Write a short note on signaling applications of CDMA system.
8.
 - a) Describe the channels used by GSM to carry and transmit information in communication systems.
 - b) Discuss the frame structure of GSM.

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