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10EC131

M.Tech. Degree Examination, June/July 2011
Wireless and Mobile Networks

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Briefly explain the limitations of wireless communication. **(08 Marks)**

b. With neat block diagram, explain the working of QPSK system. Draw the constellation diagram. **(08 Marks)**

c. In a communication channel, the bandwidth is 10MHz and SNR is 20db.
i) Determine the channel capacity.
ii) If SNR drops to 10db, how much bandwidth is needed to achieve the same channel capacity as in (i). **(04 Marks)**

2 a. Explain in detail the different types of multiple access methods. Also mention their applications in mobile communication. **(10 Marks)**

b. Discuss wireless switching technology. **(06 Marks)**

c. In a mobile communication system, path loss is 10^9. The distance between the transmitter and the receiver is 3kms. Find the transmitter operating frequency. **(04 Marks)**

3 a. Explain the design issues to be considered for designing a WBAN system. **(10 Marks)**

b. Briefly discuss WBAN technologies. **(06 Marks)**

c. What is fidelity aware routing? Explain. **(04 Marks)**

4 a. Explain the protocol stack of Bluetooth (IEEE 802.15.1). **(10 Marks)**

b. Discuss zig bee components and topology models. **(06 Marks)**

c. Consider a Bluetooth piconet, where a slave in piconet 1 is sending a packet to the master with DM3 packet format. What is the supported maximum rate of the user from slave to master direction? **(04 Marks)**

5 a. Briefly discuss the design requirement of WLAN. **(10 Marks)**

b. With neat block diagram, explain the working of direct sequence spread spectrum (DSSS) used in 802.11. **(08 Marks)**

c. Determine the transfer rate of a 40kb file with an 802.11 WLAN operating at 2Mbps. **(02 Marks)**

6 a. Mention some of the important properties of IEEE 802.16. **(05 Marks)**

b. Discuss important features of W_{IMAX}. **(10 Marks)**

c. In an application, LMDS has its own 46 Mpbs channel. According to queuing theory, if the channel is 50% loaded, the queuing time will be equal to the down loaded time. Under these conditions, how long does it take to down load a 50kb video clip over a 56 kbps modem? **(05 Marks)**

7 a. Explain in detail the different applications of WMAN. **(10 Marks)**

b. Explain the principles of cellular network. **(06 Marks)**

c. Consider a cellular network with 64 cells. Each hexagonal cell has an approximate area of $10km^2$. The total number of radio channels allotted for the network is 336. Find the total number of channels of the network if i) N = 4 ii) N = 7 and iii) N = 12, where N denotes cell reuse. **(04 Marks)**

8 a. Discuss some of the advantages and applications of wireless adhoc networks. **(08 Marks)**

b. Write notes on : i) Wireless sensor network ii) Research issues in wireless network. **(12 Marks)**

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