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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Electronics and Communication Engineering

Semester End Examination; July - 2021

Wireless Communication Techniques and Standards

Time: 3 hrs *Max. Marks: 100*

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

1 a.	Discuss the features of 1G, 2G, and 3G wireless systems.	9
b.	List differences between wireless and fixed telephone networks.	6
c.	Explain Wireless Local Loop (WLL).	5
2 a.	Define M-ary QAM. Explain the QAM modulation with related equations and constellation diagram for 16-QAM.	10
b.	What you mean by spread spectrum in communication? Explain FH-SS (Frequency Hopping Spread Spectrum) with the aid of block diagram.	10
3 a.	The GSM system uses a frame structure where each frame consists of 8 time slots, and each slot contains 156.25 bits, and the data is transmitted at 270.833 kbps in the channel. Compute; i) The time duration of a bit ii) The time duration of a slot iii) The time duration of a frame iv) How long must a user occupying a single slot wait between two successive transmissions?	8
b.	Define the following terms of CSMA protocols: i) 1-Persistent CSMA ii) Non-Persistent CSMA iii) P-Persistent CSMA iv) CSMA/CD	8
c.	If a normal GSM time slot consists of 6 trailing bits, 8.25 guard bits, 26 training bits, and 2 traffic bursts of 58 bits of data, find the frame efficiency.	4
4 a.	If W = 1.25 MHz, R = 9600 bps and a minimum acceptable Eb/No is found to be 10 dB, determine the maximum number of users that can be supported in a single cell CDMA system using, i) Omni-directional base station antennas and no voice activity detection ii) 3-Sectors at the base station and activity direction with $\alpha = 3/8$ Assume the system is interference limited.	6
b.	Explain CDMA and its features.	6
c.	Explain the concept of pure ALOHA and slotted ALOHA protocols.	8

Contd… 2

5	a.	With neat circuit diagram, explain a simplified communication S/m using an adaptive equaliser at the receiver.	10
	b.	With neat block diagram, explain decision feedback equaliser.	10
6	a.	With relevant sketch and equations, explain RAKE receiver implementation in communication.	10
	b.	List and discuss the space diversity reception methods.	10
7	a.	What is VoIP? Explain VoIP challenges.	10
	b.	Explain H.323 protocol layers with the help of diagram.	10
8	a.	Illustrate H.323 call establishment and release process.	6
	b.	List and describe VoIP quality of service.	6
	c.	Write Session Initiation Protocol (SIP) proxy server architecture and explain.	8
9	a.	What is Wi-Fi? Discuss the following standards: i) 802.11b ii) 802.11g iii) 802.11a iv) 802.11n	10
	b.	Depict the general configuration of 802.16 standard and explain.	10
10	a.	Explain Hybrid Fiber/Coax (HFC) cable system with relevant sketch.	10
	b.	Discuss in brief 802.16d and 802.16e standards and compare 802.16, 802.16d and 802.16e standards.	10

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