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P.E.S. College of Engineering, Mandya - 571 401 (An Autonomous Institution affiliated to VTU, Belagavi)

Time: 3 hrs

Eighth Semester, B.E. - Electronics and Communication Engineering Chary, M. Lech., Ph.

Semester End Examination; Aug. / Sep. - 2020

Wireless Communication Technologies

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Maxan Moorks: 1700 of Karmataka Note: i) Answer TWO full questions, selecting ONE full question from UNIT - I and UNIT - II. ii) Answer any THREE full questions, choosing from UNIT - III, UNIT - IV and UNIT - V.

UNIT - I

1 a.	. Define the following terms:				
	i) Subscriber Identity Module	ii) Foot print	iii) Page		
b.		ain mobile to mobile (cel	lular) between different service	8	
	providers call procedures.				
C.	. With block diagram, explain cord	less telephone systems.		6	
		OR			
2 a.	. With a neat block diagram, explain a first generation cellular radio network.			8	
b.	. List out the differences between wireless and fixed telephone networks.			6	
C.	. Write short notes on the following			6	
	i) Wireless local loop	ii) LMDS			
		UNIT - II			
3 a.	Derive an equation for signal-to-interface noise ratio in terms of i_s and N .			8	
b.	. What are the types of channel assignment strategies? Explain.			6	
С.	. Explain Lee's Microcell Zone con	ncept with the neat figure.		6	
		OR			
4 a.	If a total 50 MHz of bandwidth is allocated to a particular FDD cellular telephone system				
	which uses two 20 kHz simplex channels to provide full duplex voice and control channels,				
	calculate the number of channels available per cell if a system uses;				
	i) Three-cell reuse ii) Si	ix-cell reuse iii) Ty	welve-cell reuse	O	
	If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable				
	distribution of control channels ar	nd voice channels in each	of the two systems.		
b.	List the different steps involved in handoff procedure. Also discuss two types of handoff.			8	
C .	If a signal-to-interface 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 used for maximum capa	acity? If the path loss expo	nent is; i) $n = 4$ ii) $n = 3$	6	
	Assume that there are six co-char	nnel cells in the first tier,	and all of them are at the same		
	distance from the mobile. Use suit	table approximations.			

UNIT - III

5 a.	Write any three features of FDMA and non-linear effects in FDMA.	6		
b.	Define the following terms of CSMA protocols:			
	i) 1-persistant CSMA			
	ii) Non-persistent CSMA			
	iii) P-persistent CSMA			
C .	The GSM system uses a frame structure where each frame consists of eight time slots, and			
	each time 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	8		
	ii) The time duration of a slot			
	iii) The time duration of a frame			
	iv) How long must a user occupying a single time slot wait between two successive transmissions?			
5 a.	Explain the concept of pure ALOHA and slotted ALOHA protocols.	8		
b.	Compare AMPS with the TDMA based cellular system (GSM).	6		
С.	If $W = 1.25$ MHz, $R = 9600$ bps and a minimum acceptable E_b/N_0 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) Three-sectors at the base station and activity detection with $\alpha = 3/8$			
	Assume the system is interference limited.			
	UNIT - IV			
7 a.	With the help of block diagram, explain AMPS voice modulation process.	8		
b .	Describe the USDC (IS-54 and IS-136) slot and frame structure for cellular system with diagrams.			
8 a.	List and explain the Common Control Channel (CCCH) of GSM system.	6		
b.	Illustrate GSM frame structure.			
C .	Explain GSM system architecture with neat block diagram.	10		
	UNIT - V			
9 a.	What is VoIP? Explain VoIP challenges.	10		
b.	Explain H.323 protocol layers with the help of diagram.	10		
0 a.	Illustarte H.323 call establihment and release process.			
	List and describe VoIP Quality of Service.	6		
	Write Session Initiation Protocol (SIP) proxy server architecture and explain. Ut. K. Nationalist of Leaning	8		
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