U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

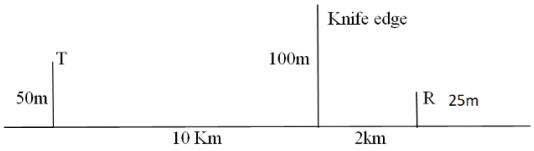
Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: Electronics and Communication Engineering **Duration: 3 hrs.**
Course Code: 22EC7PCWCN **Max Marks: 100**
Course: Wireless Communication and Networks

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

			UNIT - I	***CO***	***PO***	**Marks**
1	a)	Describe the operation of Mobile IP with the help of a schematic diagram.	*CO 1*	-	**8**
	b)	Discuss the features of Wi-Fi and Bluetooth technologies.	*CO 2*	PO *1*	**6**
	c)	Write the evolution of 2G to 5G with respect to data rate and applications.	*CO 2*	PO 1	**6**
		OR			
2	a)	Describe the architecture of GSM mobile communication with the help of a clear block diagram.	*CO 1*	-	**8**
	b)	How is the handoff process implemented in GSM, and what are its types and significance in ensuring seamless communication?	*CO 2*	PO 1	**6**
	c)	Compare FDMA, TDMA, and CDMA multiple access techniques	*CO 2*	PO 1	**6**
		UNIT - II			
3	a)	What are the different ways of improving capacity in cellular systems?	*CO 2*	PO 1	**8**
	b)	If a signal to interference ratio of 15dB is required for satisfactory forward channel performance of a cellular system, what is the frequency resuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (a) n=4. (b) = 3? Assume that there are 6 co-channels cell in the first tier, and all of them are at the same distance from the mobile. Assume N=7.	*CO 2*	PO 1	**4**
	c)	Discuss various channel assignment strategies used in cellular network.	*CO 2*	PO 1	**8**
		OR			

	4	a)	Distinguish between co channel and adjacent channel interference with an example.	*CO 2*	PO 1	**7**
		b)	If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25KHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses a) 4-cell reuse b) 7 –cell reuse and c) 12-cell resue. If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three systems.	*CO 2*	PO 1	**7**
		c)	Illustrate the concept of cellular frequency reuse for a cluster size of N equal to 7.	*CO 2*	PO 1	**6**
			UNIT - III			
	5	a)	Explain with the diagram two ray Ground Reflection model and write the relevant expression for total electric feild.	*CO 3*	PO 2	**10**
		b)	Calculate the following parameters. i) Transmitter power in dB. ii)Power at the receiver in dB iii) Pathloss in dB if height of transmitting antenna is 35meters and receiving antenna is 3 meters. Assuming free space propagation and a receiver is located 10 km from a 50 W transmitter. The carrier frequency is 900 MHz, antenna gain at transmitter and receiver is Gt = 1dB , and Gr = 1dB .	*CO 2*	PO 1	**10**
			OR			
	6	a)	Explain the Okumara and Hata Model. List applications where these models are applicable	*CO 3*	PO 2	**10**
		b)	For the geometry shown in figure 6b determine a) the loss due to knife-edge diffraction and b) the height of the obstacle required to induce 6 dB diffraction loss. Assume f= 900 MHz.  	*CO 2*	PO 1	**10**
			UNIT - IV			
	7	a)	Explain the architecture of LTE with a neat diagram and state functionalities of all elements	*CO 2*	PO 1	**10**
		b)	Explain with neat transmitter structure of OFDMA in 4G system	*CO 2*	PO 1	**10**

			OR			
	8	a)	Explain the LTE frame structure and indicate number of subcarriers and bandwidth of subcarrier	*CO 2*	PO 1	**10**
		b)	Explain the downlink transmission and reception process in the evolution of LTE to 4G	*CO 2*	PO 1	**10**
			UNIT - V			
	9	a)	List the Requirements and key performance indicators of 5G	*CO 2*	PO 1	**10**
		b)	Explain with neat structure 5G core Service-Based Architecture	*CO 2*	PO 1	**10**
			OR			
	10	a)	Explain Device to Device and Mobile to Mobile application in 5G	*CO 2*	PO 1	**10**
		b)	Discuss the need for i) Multi RAT ii) small cells in 5G	*CO 2*	PO1	**10**

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