U.S.N.										

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

Autonomous Institute Affiliated to VTU

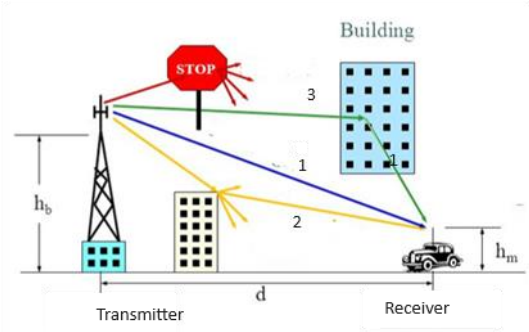
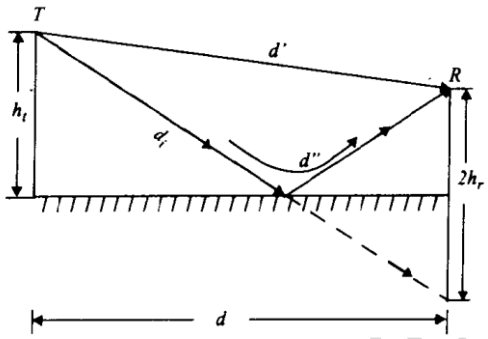
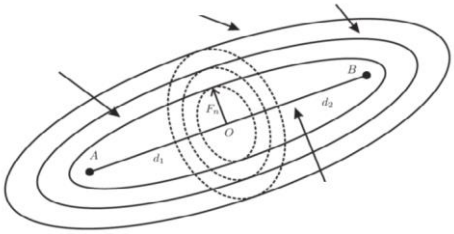
June 2025 Semester End Main Examinations

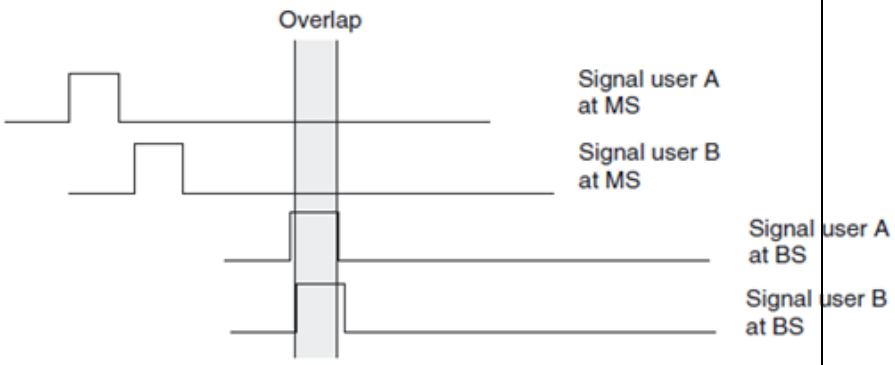
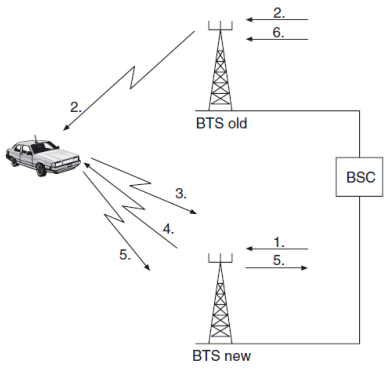
Programme: B.E. **Semester: VI**
Branch: Electronics & Telecommunication Engineering **Duration: 3 hrs.**
Course Code: 22ET6PCWCN **Max Marks: 100**
Course: Wireless and Cellular Networks

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

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		Analyze with a neat diagram, handoff scenario at cell boundary	*CO1*		**08**
	b)		Discuss the practical handoff considerations and limitations in wireless communication	*CO1*	-	**06**
	c)		Analyze a method which is used to decrease the probability of forced termination of a call due to lack of available channels	*CO1*		**06**
			OR			
2	a)		Explain the channel assignment strategies for efficient utilization of the radio spectrum	*CO1*	-	**08**
	b)		The Basavanagudi area is congested with both high-speed users and pedestrian users. Design a cellular system using suitable approach to expand the capacity with optimized handoffs. Clearly indicate the reasons for your design approach	*CO2*	*PO1*	**06**
	c)		Given a cellular system in which there are a total of 1000 radio channels available for handling traffic. It is also given that the area of a cell is 6km^2 and the area of the entire system is 2100km^2 (1) Calculate the system capacity if N=7. (2) How many times would the cluster of size 4 have to be replicated in order to approximately cover the entire cellular area? Calculate the system capacity if N=4.	*CO2*	*PO1*	**06**
			UNIT - II			
3	a)		With necessary equations and diagram, analyze the model that is used to predict the signal strength when there is a clear LoS path between the transmitter and the receiver.	*CO2*	*PO1*	**08**
	b)		Analyze with necessary equations, the most widely used model for signal prediction in urban areas.	*CO3*	*PO2*	**06**
	c)		Analyze the diagram and comment on the main effects due to which the RF signal suffers when propagating through a wireless	*CO3*	*PO2*	**06**

			medium. With proper justification, indicate the direct and multipath components.  			
			OR			
	4	a)	Analyze the physical factors that influence small scale fading	*CO3*	*PO2*	**08**
		b)	Two ray ground reflection model is shown in fig below. Prove that $\Delta = d'' - d' = 2hthr/d$  	*CO2*	*PO1*	**06**
		c)	Analyze the diagram shown below and derive the expression for F_n  	*CO2*	*PO1*	**06**
			UNIT - III			
	5	a)	Analyze the problem in the fig. shown below with an example and suggest a suitable solution to overcome the same	*CO3*	*PO2*	**08**

						
	b)	Analyze the component of a Network Switching System of GSM network which stores semi-permanent subscriber information		*CO3*	*PO2*	**06**
	c)	Discuss the frequency correction / synchronization channel of a mobile station in GSM		*CO1*	-	**06**
		OR				
6	a)	Identify the type of handover in the fig. shown below and analyze the steps for handover 		*CO3*	*PO2*	**08**
	b)	Analyse the various fields of a normal transmission burst in GSM		*CO3*	*PO2*	**06**
	c)	With a neat diagram, explain TDMA system		*CO1*	-	**06**
		UNIT - IV				
7	a)	Analyze the multiple access technique that operates on the principle of dividing communication channels into distinct frequency bands with a neat diagram		*CO3*	*PO2*	**08**
	b)	With a neat diagram explain E-UTRAN		*CO2*	*PO1*	**06**
	c)	With examples, distinguish between OFDM and FDM		*CO2*	*PO1*	**06**
		OR				
8	a)	Assess the multiple access technique that utilizes buffer and burst method for data transmission, and provide a comprehensive evaluation of its features		*CO3*	*PO2*	**08**
	b)	Examine the three distinct waveform patterns given in the figure below and explain the significance of these waveforms in the context of LTE 		*CO1*		**06**

		c)	Analyze the fundamental benefits of multiple antennas	*CO1*		**06**
			UNIT - V			
	9	a)	Analyze the utilization of all spectrum options by 5G with examples	*CO3*	*PO2*	**08**
		b)	Briefly discuss the capabilities of 5G	*CO1*	-	**06**
		c)	Analyze the Ultra-high reliability and availability feature of 5G with an example	*CO3*	*PO2*	**06**
			OR			
	10	a)	Describe the roadmap for the evolution towards 5G communications and the key milestones and technological advancements that have contributed to its development?	*CO1*		**08**
		b)	Discuss the three main impediments for mmwave communication	*CO1*		**06**
		c)	Discuss the advantages of Network virtualization	*CO1*		**06**

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