CBCS SCHEME

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BEC703

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Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Wireless Communication Systems

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Derive an Expression for Rayleigh Fading Wireless Channel.	10	L2	CO2
	b.	In the wireless Rayleigh fading channel consider a transmit power Pt (dB) = 20 dB. What is the probability that the power at the receiver is greater than Pr(dB) = 10 dB?	10	L2	CO1
		OR			
Q.2	a.	Explain the modeling of wireless systems with proper equations.	10	L2	CO1
	b.	Give the mathematical equations for RMS Delay Based on Average Power Profile.	10	L2	CO1
		Module – 2			
Q.3	a.	Explain the Properties of PN sequences.	10	L2	CO1
	b.	Explain any two advantages of CDMA.	10	L2	CO1
		OR			
Q.4	a.	Illustrate OFDM with an example.	10	L2	CO1
	b.	With neat schematic explain MIMO-OFDM Transmitter.	10	L2	CO1
		Module – 3			
Q.5	a.	Explain GSM Network Architecture.	10	L2	CO1
	b.	Explain IP-Based Flat Network Architecture.	10	L2	CO1
		OR			
Q.6	a.	Explain Multi Antenna techniques.	10	L2	CO1
	b.	Explain LTE Network Architecture with necessary diagram.	10	L2	CO1
		Module – 4			
Q.7	a.	Explain MIMO System Model.	10	L2	CO1
	b.	Derive Expression for MIMO Zero-Forcing (ZF) Receiver.	10	L2	CO1

		OR			
Q.8	**a.**	Compute the MIMO zero-forcing receiver for the channel matrix H given $H = \begin{bmatrix} 2 & 3 \\ 1 & 3 \\ 1 & 2 \end{bmatrix}$	**10**	**L3**	**CO2**
	b.	Derive expression for MIMO MMSE Receiver.	**10**	**L2**	**CO1**
		Module – 5			
Q.9	**a.**	With neat diagram, explain design principles of LTE Network.	**10**	**L2**	**CO1**
	b.	Explain the Hierarchical Channel Structure of LTE.	**10**	**L2**	**CO1**
		OR			
Q.10	**a.**	Explain the time domain frame structures of OFDM.	**10**	**L2**	**CO1**
	b.	Explain Uplink SC-FDMA Radio Resources.	**10**	**L2**	**CO1**

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