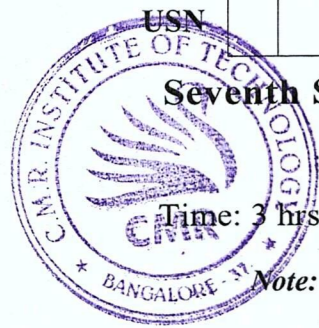


# CBCS SCHEME

BEC703



USN \_\_\_\_\_

## 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 $P_t$ (dB) = 20 dB. What is the probability that the power at the receiver is greater than $P_r$ (dB) = 10 dB?	10	L2	CO1
<b>OR</b>					
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
<b>Module – 2</b>					
Q.3	a.	Explain the Properties of PN sequences.	10	L2	CO1
	b.	Explain any two advantages of CDMA.	10	L2	CO1
<b>OR</b>					
Q.4	a.	Illustrate OFDM with an example.	10	L2	CO1
	b.	With neat schematic explain MIMO-OFDM Transmitter.	10	L2	CO1
<b>Module – 3</b>					
Q.5	a.	Explain GSM Network Architecture.	10	L2	CO1
	b.	Explain IP-Based Flat Network Architecture.	10	L2	CO1
<b>OR</b>					
Q.6	a.	Explain Multi Antenna techniques.	10	L2	CO1
	b.	Explain LTE Network Architecture with necessary diagram.	10	L2	CO1
<b>Module – 4</b>					
Q.7	a.	Explain MIMO System Model.	10	L2	CO1
	b.	Derive Expression for MIMO Zero-Forcing (ZF) Receiver.	10	L2	CO1

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<b>OR</b>					
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
<b>Module – 5</b>					
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
<b>OR</b>					
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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