

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)
Supplementary Exam *Feb - March 2024*

(B. Tech.) Program: EXTC

Examination: LY Semester: VII

Course Code: EXC702 Course Name: Mobile Communication Systems

Date of Exam: *4/3/2024*

Duration: 03 Hours

Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT Level
Q 1	Solve any six questions out of eight.	12		
i)	Explain frequency reuse concept.	02	1	U
ii)	List factors influencing multipath in small scale fading.	02	2	U
iii)	Explain GSM services and features.	02	3	U
iv)	List technical parameters of UMTS Technology.	02	4	U
v)	List the bands for FDD operation in LTE.	02	5	U
vi)	Explain features of MIMO antenna systems in mobile communication.	02	6	U
vii)	Define multipath fading in small scale wave propagation.	02	2	U
viii)	Compare technical parameters of GSM and GPRS.	02	3	U
Q.2	Solve any four questions out of six.	16		
i)	Locate co channel cells in a cellular area for given $i=3, j=2$ values.	04	1	U
ii)	Explain free space wave propagation model with required equations and diagrams.	04	2	U

iii)	Discuss IS-95 CDMA handoff procedures with diagrams.	04	3	U
iv)	Compare technical specifications of UMTS and CDMA 2000 technology.	04	4	U
v)	Explain LTE system architecture with interfaces.	04	5	U
vi)	Describe the concept of Smart Antenna systems with relevant architecture.	04	6	U

Q.3 Solve any two questions out of three. 16

i)	Explain techniques used to improve the coverage and capacity of cellular network with diagrams and appropriate equations.	08	1	U
ii)	Explain GSM architecture with a neat diagram.	08	3	U
iii)	Describe Physical, Transport and Logical channels in 4G LTE.	08	5	U

Q.4 Solve any two questions out of three. 16

i)	If a transmitter produces 50 watts of power, express the transmit power in units of (a) dBm, and (b) dBW. If 50 watts is applied to a unity gain antenna with a 900 MHz carrier frequency, find the received power in dBm at a free space distance of 100 m from the antenna, What is P (10 km) 2 Assume unity gain for the receiver antenna.	08	2	U
ii)	Describe forward and reverse channels of CDMA 2000.	08	4	U
iii)	Describe basic structure of a cognitive transceiver with a suitable diagram.	08	6	U
