

Extra
EXTC
mobile comm

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec 2023

(B. Tech) Program: Electronics & Telecommunication Engineering

Examination: LY Semester: VII *Scheme: II*

Course Code: EXC702 and Course Name: Mobile Communication System

Date of Exam: 10/12/2023

Duration: 2.5 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 umbrella cell concept.	02	1	U
ii)	Explain small scale fading in cellular communication.	02	2	U
iii)	What are the various services provided by GSM?	02	3	U
iv)	Explain the evolution path of CDMA 2000 technology.	02	4	U
v)	List various spectrum bands used in LTE.	02	5	U
vi)	What are the features of cognitive radio networks?	02	6	U
vii)	Explain in brief small scale multipath propagation.	02	2	U
viii)	Define GSM identifiers in short.	02	3	U
Q.2	Solve any four questions out of six.	16		
i)	For a cellular network, if Signal to Interference ratio = 15dB, what is the frequency reuse factor and cluster size that should be used for maximum channel capacity if path loss component $n=4$. Assume there are 6 co-channel cells and all are at equal distance from mobile.	04	1	U
ii)	Define the factors which influence small scale fading.	04	2	U

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| iii) | Explain GSM speech encoding procedure in detail. | 04 | 3 | U |
| iv) | Discuss various releases and standardizations of UMTS with their names, year of deployment and features. | 04 | 4 | U |
| v) | Explain Network architecture of LTE with appropriate diagram. | 04 | 5 | U |
| vi) | Describe Smart Antenna Systems with a diagram. | 04 | 6 | U |

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

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|------|---|----|---|---|
| i) | Explain the system capacity and co channel interference with diagram and related equations. | 08 | 1 | U |
| ii) | Explain uplink and downlink channels used in CDMA 2000 Technology. | 08 | 4 | U |
| iii) | Explain Physical, Transport and Logical channels in 4G LTE. | 08 | 5 | U |

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

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|------|--|----|---|---|
| i) | Explain knife edge diffraction model with required equations and diagram. | 08 | 2 | U |
| ii) | Explain GSM network authentication and security procedure with a neat diagram. | 08 | 3 | U |
| iii) | Describe Massive MIMO antenna systems with diagram. | 08 | 6 | U |
