

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

**End Semester Exam**

Nov – Dec 2021

(B. Tech ) Program: EXTC

Examination: LY Semester: VII

Course Code: 1UEXC702 Course Name: Mobile Communication Systems

**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
<b>Q 1</b>	<b>Solve any six questions out of eight:</b>	<b>12</b>		
i)	Explain Channel Assignment Strategies.	02	CO1	Understand
ii)	Discuss the factors Influencing Small-Scale Fading.	02	CO2	Understand
iii)	Explain the frequency and channel specifications of IS-95 CDMA.	02	CO3	Understand
iv)	Explain UMTS air interface specifications.	02	CO4	Understand
v)	Sketch protocol structure of 3GPP LTE.	02	CO5	Apply
vi)	Explain advantages of software defined radio communications systems.	02	CO6	Understand
vii)	Explain fading Effects Due to Doppler Spread.	02	CO2	Understand
viii)	List GSM services and features.	02	CO3	Understand
<b>Q.2</b>	<b>Solve any four questions out of six.</b>	<b>16</b>		
i)	Explain Umbrella cell concept in cellular system with neat diagram.	04	CO1	Understand
ii)	If a signal-to-interference ratio of 15 dB is required for satisfactory forward channel performance of a	04	CO2	Evaluate

	cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (a) $n = 4$ , (b) $n = 3$ ? Assume that there are six co-channel cells in the first tier, and all of them are at the same distance from the mobile. Use suitable approximations.			
iii)	Explain GSM protocol architecture in detail.	04	CO3	Understand
iv)	Describe power control in CDMA2000.	04	CO4	Understand
v)	Explain Logical and Physical channels in LTE.	04	CO5	Understand
vi)	Explain forward and reverse channels of UMTS.	04	CO6	Understand

<b>Q.3</b>	<b>Solve any four questions out of six.</b>	<b>16</b>		
i)	Compare SDMA, FDMA, TDMA and CDMA.	08	CO1	Analyze
ii)	Write note on GPRS technology.	08	CO3	Understand
iii)	Explain with diagram Hand off and power control in 3G systems.	08	CO5	Understand
<b>Q.4</b>	<b>Solve any two questions out of three.</b>	<b>16</b>		
i)	Derive knife edge diffraction model along with diffraction gain equations.	08	CO2	Analyze, Evaluate
ii)	Explain in detail about UMTS architecture with suitable diagram.	08	CO4	Understand
iii)	Write a note on MIMO antennas.	08	CO6	Understand