Total number of printed pages: **Programme(UG)/Semester VII/UECE712A**

2022

Wireless and Mobile Communication

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	What do you mean by multiplexing and multiple access? Classify various multiple access schemes. Explain the working of FDMA. What are its limitations?	10
	b)	What is TDD/TDMA? Describe the frame structure of TDMA. How does the frame generation happen in TDMA?	6
	c)	A full duplx wireless cellular system is allocated a total spectrum of 25 MHz and each simplex channel has 15 kHz RF bandwidth. Find i) total no, of full duplex channels available, ii) no. of channels per cell site for 7-cell reuse pattern.	4
2.	a)	Describe the GSM system architecture and and the various interfaces used in GSM. What are the various GSM control channels.	10
	b)	A GSM system has 6 bits as trailing bits, 26 training bits, 8.25 guard bits and 2 bursts of 58 bits of encrypted data which is transmitted at 270.833 kbps in the channel. Find i) frame rate and ii) frame efficiency.	5

	c)	Find out the total number of slots for a GSM system having 25 MHz forward link. The bandwidth for each channel is 200 kHz and 8 speech channels are supported per radio channel. Assume no guard band.	5
3.	a)	Find out the expressions for efficiency and no. of channels for TDMA system.	7
	b)	If GSM uses a frame structure of eight time slots, and each time slot contains 156.25 bits, and data rate is 270.833 kbps in the channel, find the time duration of i) a bit, ii) a time slot and iii) a frame.	6
	c)	Write about the features and specifications of forward and reverse channels of IS-95.	7
4.	a)	Explain how the co-channel reuse ratio, Q=4.6 is not sufficient to combat co-channel interference? Find out SIR in the worst case for N=7 using omnidirectional antenna. Draw relevant diagram.	10
	b)	Explain with appropriate diagram how can cell sectoring improve SIR in the situation stated in Q.No.4.a. Find out SIR for N=7 and N=4 for the worst case using 120^0 directional antenna.	10
5.	a)	Define handoff phenomenon in mobile cellular system. What are the different types of handoff? What are the approaches used to initiate a handoff.	3+2+5= 10
	b)	Explain two-handoff-level algorithm for delayed handoff. What are the advantages of delayed handoff? What is forced handoff?	4+3+3= 10
6.	a)	Write down the salient features of Bluetooth technology. Describe various Bluetooth connection modes?	3+6=9

	b)	Describe the bluetooth protocol stack.	6
	c)	For a 7-cell reuse system and 120^0 sectoring, the no, of interferers in the first tier is reduced from 6 to 2. Find the improved SIR. Take path loss exponent as 4.	5
7.		Write short notes on -i) WiMAX, ii) CDMA, iii) Bluetooth frame format, iv) L2CAP.	5*4=20