GURU NANAK INSTITUTE OF TECHNOLOGY
An Autonomous Institute under MAKAUT
2022
MOBILE COMMUNICATION
EI802A

TIME ALLOTTED: 3 Hrs. **FULL MARKS: 70**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

GROUP – A
(Multiple Choice Type Questions)

Answer any ***ten*** from the following, choosing the correct alternative of each question: **10×1=10**

		Marks	CO No
1. (i)	A cordless telephone operates with one – a) UPS b) Fixed port c) protection circuit d) standby processor	1	CO1
(ii)	For a cellular system, if there are N cells and each cell is allocated k channel. What is the total number of available radio channels, S? a) S=k*N b) S=k/N c) S=N/k d) $S=k^N$	1	CO1
(iii)	A single frame in GSM frame structure consists of – a) 10 time slots b) 8time slots c) 7time slots d) 4 time slots	1	CO4
(iv)	The Indoor propagation model takes care of – a) Losses due to indoor antennas b) Losses due to walls c) Losses due to other wireless equipment d) Losses due to active devices operating in ISM band	1	CO3
(v)	Full form of SMS: a) short messaging services b) short messaging systems c) Short message service d) none of the above	1	CO2

(vi)	GSM supports- a) 1.0 GHz to 2.0 GHz b) 1.8 GHz to 2.0 GHz c) 2.0GHz to 2.2 GHz d) 2.8GHz to 3.0 GHz	1	CO3
(vii)	X.25 protocol is an example of- a) Circuit switching b) Packet Switching c) Message switching d) none of these	1	CO3
(viii)	vii) Which satellite has a distance of 36000km from the centre of the earth- a) GEO b) MEO c) LEO d) HEO	1	CO4
(ix)	What is frequency reuse? a) process of using the same radio frequencies on radio transmitter sites within a geographic area b) Process of selection of mobile users c) Process of selecting frequency of mobile equipment d) Process of selection of number of cells	1	CO1
(x)	What are FCC and RVC? a) Forward Control Channel & Reverse Voice Call b) Forward Control Channel & Reverse Voice Channel c) Forward Control Call & Reverse Voice Call d) none of the above	1	CO4
(xi)	Co channel interference in GSM System can be reduced by- a) Micro cells b) Dynamic channel allocation c) sectoring d) guard band	1	CO2
(xii)	For the hexagonal cell geometry of seven cells cluster the co-channel reuse ratio Q= D/R is- a) 3 b) 4.58 c) 5.20 d) 6	1	CO1

GROUP – B
(Short Answer Type Questions)

(Answer any *three* of the following) **3 x 5 = 15**

		Marks	CO No.
2.	What do you mean by Co-channel cell? What is the procedure to locate the co channel cells? Explain in brief.	5	CO1

3.	If a signal-to-interference ratio of 15dB is required for satisfactory forward channel performance of a cellular system, what is frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (a) n = 4, 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 approximation.	5	CO4
4.	What is sub-satellite point? What is the visibility condition of a satellite?	5	CO2
5.	What do you mean by Spread Spectrum modulation?	5	CO3
6.	What is ISM band and what are its advantages?	5	CO2

GROUP – C
(Long Answer Type Questions)

(Answer any *three* of the following) **3 x 15 = 45**

		Marks	CO No.
7. a)	Draw and Explain GSM architecture.	7	CO1
b)	Explain the signal processing technique in GSM	6	CO1
c)	Write down the name of the different channels used in GSM.	2	CO1
8. a)	What is Fresnel zone? How is it related to the path loss of radio wave transmission?	3	CO3
b)	Explain the concept of Okumura propagation model as applicable to the PCS.	5	CO3
c)	Define hand-off with suitable diagram? What is frequency reuse factor?	5	CO3
d)	Explain the term EIRP. What is WIU?	2	CO3
9. a)	Suppose in a CDMA system, sender0 has code (1, -1) and data (1,1,1,0) and sender 1 has code (1,1) and data (1,1,0,0) and both sender transmit simultaneously. Then draw the tables describing the coding and decoding steps.	5	CO2
b)	Explain why power control is necessary in CDMA system?	3	CO2
c)	Explain why we can increase the number of subscribers in CDMA freely.	2	CO2
d)	Explain with the timing diagram how a cellular telephone call is made.	5	CO1
10.a)	In packet radio multiple access technique, explain with a schematic, how Vulnerable period is set? How does we measure throughput of the system?	6	CO4
b)	Draw and explain the architecture of Cellular Packet Switched Architecture.	6	CO4
c)	Why packet switching is preferred for Personal Communication network (PCN) ?	3	CO4

11.	Write a short notes from the given following (any three)	3x5=15		
a)	GPRS	5	CO3
b)	Durkin's model of outdoor propagation	5	CO1
c)	Bluetooth	5	CO2
d)	ALOHA Protocol	5	CO2
e)	Wireless LAN	5	CO4