SRM Institute of Science and Technology

College of Engineering and Technology

DEPARTMENT OF ECE

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamil Nadu

Academic Year: 2023-24 (ODD)

| QP |
| SET A |

Test: CLAT-1   **Date:** 8/8/2023

Course Code & Title: 18ECC301T, WIRELESS COMMUNICATION   **Duration:** 1Hr

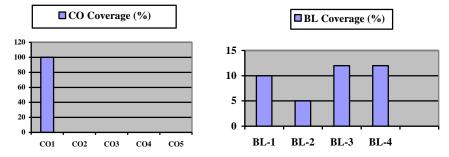**Year & Sem:** IV & VII   **Max. Marks:** 25

Course Articulation Matrix:

	18ECC301T - Wireless Communication	Program Outcomes (POs)														
		Graduate Attributes												PSO		
COs	**Course Outcomes (COs)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO-1	Interpret the concepts of Wireless communication and basic cellular networks	3	-	-	3	-	-	-	-	-	-	-	2	-	-	-
CO-2	Analyze different Radio wave propagation models for cellular communication	-	3	-	3	-	-	-	-	-	-	-	-	-	-	3
CO-3	Apply different multipath propagation channel models in wireless systems	-	3	3	-	-	-	-	-	-	-	-	-	-	-	2
CO-4	Illustrate the Link performance improvement techniques	-	3	-	-	-	-	2	-	-	-	-	-	-	-	3
CO-5	Summarize different wireless communication standards and systems	-	-	2	-	-	2	-	-	-	-	-	-	2	-	-

Part - A
(5 x 1 = 5 Marks)
Instructions: Answer all Questions

Q. No	Questions	Marks	BL	CO	PO

1	While locating a co-channel cell, a RF site engineer will do the following mapping after moving 'i' cells along any particular direction
	   a. Turn 90 deg counter clockwise & move j cells
	   b. Turn 60 deg clockwise & move j cells
	   c. Turn 60 deg counter clockwise & Move j cells
	   d. Move j cells and Turn 60 deg counter clockwise
		1	1	1	1

2	Identify the channel to be used for a transmission of device power level from mobile station to base station
	
	   a. Forward Control Channel
	   b. Reverse Control Channel
	   c. Forward Voice Channel
	   d. Reverse Voice Channel
		1	1	1	1

3	What is the distance between two co channel base stations?
	
	   a. 3N
	   b. $R\sqrt{3N}$
	   c. 3RN
	   d. 3 N
		1	2	1	4

4	What is the Co-Channel reuse value for a cluster size of 12?
	
	   a. 3
	   b. 4.58
	   c. 6
	   d. 3
		1	4	1	4

#	Question	Marks	CO	BL	PO
5	What is the cluster Size for i=4 and j=3? a. 37 b. 19 c. 49 d. 7	1	4	1	4

Part – B
(2 x 4 = 8 Marks)
Instructions: Answer any two questions

#	Question	Marks	CO	BL	PO
6	Compare blocked call cleared system and blocked call delayed systems.	4	3	1	12
7	"Hexagonal shape are chosen to be the optimum cell geometry", Ornate the importance of the aforementioned statement.	4	3	1	12
8	Neatly sketch the handoff strategies employed at cell boundary.	4	2	1	1

Part – C
(1 x 12 = 12 Marks)
Either or

#	Question	Marks	CO	BL	PO

9	a. Consider a cellular system in which total available voice channels to handle the traffic are 900. The area of each cell is 5 km^2 and the total coverage area of the system is 2000 km^2.
	Calculate:
	  i. The system capacity if the cluster size N is 4
	  ii. The system capacity if the cluster size is 7.
	  iii. Does decreasing N increase the system capacity?
		10	4	1	4

	b. How the umbrella cell approach reduces the number of handoffs?	2	2	1	4

or

#	Question	Marks	CO	BL	PO
10	a. With the aid of a timing diagram, elaborate the call establishment process from a mobile to another mobile user in a cellular environment.	8	1	1	1
	b. How many users can be supported for 0.2% blocking probability for the 10,20 trunked channels in a blocked call cleared system? Assumed that each user generates 0.1 Erlangs of traffic. **Refer table**	4	3	1	4

Table. Capacity of an Erlang B System

Number of Channels C	Capacity (Erlangs) for GOS			
	= 0.01	= 0.005	= 0.002	= 0.001
2	0.153	0.105	0.065	0.046
4	0.869	0.701	0.535	0.439
5	1.36	1.13	0.900	0.762
10	4.46	3.96	3.43	3.09
20	12.0	11.1	10.1	9.41

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions

Evaluation Sheet

Name of the Student: **Register No.:**

Q. No	CO	PO	Maximum Marks	Marks Obtained	Total
Part- A (5 x 1= 5 Marks)					
1	1	1	1		
2	1	1	1		
3	1	4	1		
4	1	4	1		
5	1	4	1		
Part- B (2 x 4= 8 Marks)					
6	1	12	4		
7	1	12	4		
8	1	1	4		
Part- B (2 x 4= 8 Marks)					
9a	1	1	10		
9b	1	4	2		
10a	1	1	8		
10b	1	4	4		

Consolidated Marks:

CO	Maximum Marks	Marks Obtained
1	25	
Total		

PO	Maximum Marks	Marks Obtained
1	14	
4	19	
12	8	
Total	41	

Signature of Course Teacher