

#### SRM Institute of Science and Technology College of Engineering and Technology

SET B

QP

#### DEPARTMENT OF ECE

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

Academic Year: 2023-24 (ODD)

Test: CLAT-1

Course Code & Title: 18ECC301T, WIRELESS COMMUNICATION

Year & Sem: IV & VII

Max. Marks: 25

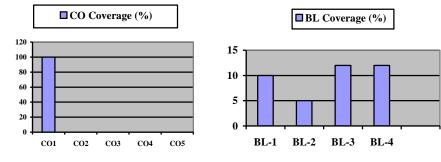
#### **Course Articulation Matrix:**

	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	-	-	-	-	1	-	-	-	-	-	-	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	СО	PO
1	Adjacent channel interference can be minimized through	1	1	1	1
	<ul> <li>a. Changing frequency of base stations</li> <li>b. Careful filtering and channel assignments</li> <li>c. Increasing number of base stations</li> <li>d. Increasing number of control channels</li> </ul>				
2	Hard handoff is also known as	1	1	1	1
	<ul> <li>a. Partial Handoff</li> <li>b. Make before Make</li> <li>c. Break before make</li> <li>d. Make before break</li> </ul>				
3	During the handoff process in the cellular system, the margin	1	2	1	4
	(Threshold) is given by $a.  \Delta = \Pr(\text{HANDOFF}) - \Pr\left(\text{MAX. USABLE}\right) \\ b.  \Delta = \Pr(\text{HANDOFF}) - \Pr\left(\text{MIN. USABLE}\right) \\ c.  \Delta = \Pr(\text{SAR OF THE MOBILE}) - \Pr\left(\text{MIN.USABLE}\right) \\ d.  \Delta = \Pr(\text{CELL}) - \Pr\left(\text{BASE STATION}\right)$				
4	In hexagonal shaped type of cell with 6 vertices, how many antennas are needed for edge excitation	1	4	1	4
	a. 1 b. 6 c. 3 d. 2				

5	What is the Co-Channel reuse value for a cluster size of 7?	1	4	1	4
		_			
	a. 3				
	b. 4.58				
	c. 6				
	d. 6.24				
	Part – B				
	$(2 \times 4 = 8 \text{ Marks})$				
	Instructions: Answer any two questions				
6	Distinguish between Fixed channel assignment and Dynamic channel assignment in a cellular network.	4	3	1	12
7	"Cell splitting increases the capacity of a cellular system:", Justify the statement.	4	3	1	12
8	Sketch the various types of handoff scenario in mobile cellular system.	4	2	1	1
	Part – C				
	(1 x 12 = 12 Marks)				
	(1 x 12 = 12 Marks) Either or				
9	a. If a signal-to-interference ratio of 15 dB is required for	10	4	1	4
9	satisfactory forward channel performance of a cellular	10	_ +	1	_
	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.				
	b. For a specific geographic area in cellular concept, how	2	2	1	4
	would you calculate the frequency reuse ratio.				
	or				
10	a. With the aid of a timing diagram, elaborate the call	8	1	1	1
	establishment process from a Landline to another mobile		1		
	user in a cellular environment.		1		
	b. How many users can be supported for 0.5% blocking	4	3	1	4
	probability for the 10, 20 trunked channels in a blocked call		1		
	cleared system? Assumed that each user generates 0.1		1		
	Erlangs of traffic. Refer table		1		
	Table Capacity of an Erlang B System		1		
	Number of Capacity (Erlangs) for GOS Channels C = 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		1		
	5 1.36 1.13 0.900 0.762		1		
	10 4.46 3.96 3.43 3.09 20 12.0 11.1 10.1 9.41		1		
1	20 12.0 11.1 10.1 9.41		1		1

### Course Outcome (CO) and Bloom's level (BL) Coverage in Questions ${\bf CO}$



# **Evaluation Sheet**

# Name of the Student:

# **Register No.:**

Part- A (5 x 1= 5 Marks)								
Q.	CO	PO	Maximum	Marks	Total			
No			Marks	Obtained				
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	$3(2 \times 4 = 8 \text{ M})$	arks)				
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**