Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

School of Engineering

Mid - Term Examinations - November2024

Semester: VII **Date:** 06/11/2024

Course Code: ECE3054 **Time:** 11.45am to 01.15pm

Course Name: Mobile Communication **Max Marks:** 50

Program: B.Tech - ECE **Weightage:** 25%

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. 5Qx2M =10M

1	What is soft handoff? Mention its advantages	2 M	Remembering	CO1
2	Determine the co-channel reuse ratio for the cluster with 20 cells.	2M	Remembering	CO1
3	Mention the basic propagation mechanisms, which impact propagation in mobile Communication.	2M	Remembering	CO1
4	Write the equation to calculate the no. of channels in FDMA system.	2M	Remembering	CO2
5	What is slotted Aloha?	2M	Remembering	CO2

Part B

Answer ALL Questions. Each question carries 10 marks. 4QX10M=40M

6	6a	Mention the goals of a cellular system	2M	Remembering	CO1
	6b	If 20 MHz of total spectrum is allocated for a duplex wireless cellular system and each duplex channel has 25KHz RF bandwidth, Find the number of duplex channels.	3M	Understanding	CO1
	6c	Draw the network infrastructure and explain its components through which a landline user can communicate with a mobile user.	5M	Apply	CO1
		OR			
7	7a	Explain the Co- channel interference reduction factor and derive the general formula for S/I.	7M	Apply	CO1
	7b	Co-channel cells are those cells that use the same frequency in a given coverage area. What is the interference caused by it? What is the value of co-channel interference reduction factor in a 7-cell reuse pattern?	3M	Apply	CO1

8	8a	Assume a system of 32 cells with a cell radius of 1.6 km, a total of 32 cells, a total frequency bandwidth that supports 336 traffic channels, and a reuse factor of N = 7. (a) If there are 32 total cells, what geographic area is covered, how many channels are there per cell, and what is the total number of concurrent calls that can be handled? (b)Repeat for a cell radius of 0.8 km and 128 cells.	5M	Apply	CO1
	8b	Discuss in detail to minimize interference & maximize use of capacity using channel assignment strategies.	5M	Understanding	CO1
		OR			
9		Explain the concept of frequency reuse in a cellular system for N=4. How Cell planning and locating of co channel cells take place for the same.	10M	Apply	CO1
10		A Channel access method where all users within the system can communicate at the same time using the same channel by a far distance apart. Explain the method briefly with a block diagram and mention its pro's and con's.	10M	Apply	CO2
		OR			
11	11a	Discuss about the major problem that hurts mobile communication badly in CDMA system.	3 M	Understanding	CO2
	11b	If GSM uses a frame structure where each frame consists of eight time slots, and each time slot contains (5) 156.25 bits, and data is transmitted at 270.833 kbps in the channel, find (á) the time duration of a bit, (b) the time duration of a slot, (e) the time duration of a frame, and (d) how long must a user occupying a single time slot wait between two successive transmissions.	7M	Apply	CO2
12	12a	Explain the term interference in the space, time, frequency, and code domain. What are countermeasures in SDMA, TDMA, FDMA, and CDMA systems?	4M	Understanding	CO2
	12b	Discuss about the protocols in which any station can transmit data to a channel at any time without carrier sensing diagrammatically.	6M	Apply	CO2
		OR			
13		Discuss the Time Division Multiple Access (TDMA) technique in detail, including its working principles, benefits, and drawbacks. Furthermore, compare TDMA with Frequency Division Multiple Access (FDMA), focusing on how each technique allocates resources, manages interference, and supports multiple users in communication systems. Highlight the key distinctions between the two.	10M	Understanding	CO2