Roll No.											

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 09- 12-2025 **Time:** 01:00pm – 04:00pm

School: SOE	**Program:** B.Tech - ECE	
Course Code : ECE3054	**Course Name :** Mobile Communication	
Semester: VII	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**14**	**14**	**26**	**26**	**20**

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. **10Q x 2M=20M**

1	Discuss the Pros and Cons of wired and wireless network.	**2 Marks**	**L2**	**CO1**
2	Explain the meaning of the term “frequency reuse” and the “frequency reuse factor.	**2 Marks**	**L2**	**CO1**
3	In an FDMA system, total spectrum bandwidth is 12.5Mhz, each channel is of 30Khz and guard band is 10kHz. Find the total number of channels available in the system.	**2 Marks**	**L2**	**CO2**
4	Explain how guard spaces are implemented or maintained between users in a CDMA system.	**2 Marks**	**L2**	**CO2**
5	Outline the role of the Subscriber Identity Module (SIM) in GSM?	**2 Marks**	**L2**	**CO3**
6	Compare 1G and 2G technologies.	**2 Marks**	**L2**	**CO3**
7	State the functions of the Visitor Location Register (VLR) in a GSM network?	**2 Marks**	**L2**	**CO3**
8	Discuss Care-of Address (COA) and its types.	**2 Marks**	**L2**	**CO4**

9	Differentiate between agent advertisement and agent solicitation.	2 Marks	L2	CO4
10	Illustrate tunneling in Mobile IP?	2 Marks	L2	CO4

Part B

Answer the Questions **Total 80 Marks.**

11.	a.	(i)Derive the expression for the Signal-to-Interference Ratio (SIR) in the context of co-channel interference in a cellular network. Assume a system with N cells in a cluster and Q=D/R where D is the co-channel distance and R is the cell radius.	5 Marks	L3	CO1
		(ii) Analyze the impact of increasing the cluster size N on the SIR. Explain the trade-off between capacity and interference in this scenario.	5 Marks	L4	
	b.	Why do Hidden and Exposed terminal problem arise? Illustrate briefly with an example. How the above problem is overcome in wireless medium. Explain.	10 Marks	L3	CO2

Or

12.	a.	Apply your understanding of handoff and its types in mobile communication systems. Explain its significance in maintaining call continuity and also how the handoff margin affects system performance, and discuss the challenges associated with its selection.	10 Marks	L3	CO1
	b.	Explain the principles of **FDMA**, **TDMA**, and **CDMA** as multiple access techniques used in mobile communication systems. Analyze the advantages and limitations of these techniques in handling increasing user density and interference in a cellular network. Support your analysis with examples of real-world applications where these techniques are effectively implemented.	10 Marks	L4	CO2

13.	a.	Describe the architecture of GSM and explain the roles of the major components in the Network Switching Subsystem (NSS).	10 Marks	L3	CO3
	b.	Describe the different types of channels in GSM, including traffic channels (TCH), control channels (CCH), and broadcast channels (BCH). Analyze the function and importance of all channels	10 Marks	L3	CO3

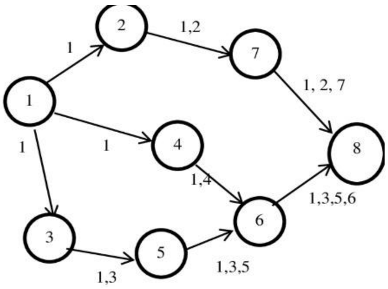
Or

14.	a.	Analyze the architecture of General Packet Radio Service (GPRS) and explain how its components and interfaces work	10 Marks	L4	CO3

		together to enable packet-switched data communication.			
	b.	Explain the architecture of LTE and illustrate how its components interact to provide seamless data connectivity and mobility management. Apply your understanding by describing a real-world data transmission or handover scenario within the LTE network.	**10 Marks**	**L3**	**CO3**

15.	**a.**	Given a network graph, demonstrate how DSDV generates and maintains routing tables at each node. Identify the number of updates required for a topology change.	**10 Marks**	**L3**	**CO4**
	b.	Analyze the efficiency of a reactive protocol like DSR in a scenario where node mobility is high and compare it with a proactive protocol like DSDV. Provide quantitative examples for packet overhead.	**10 Marks**	**L4**	**CO4**

Or

16.	**a.**	Analyze the route discovery process in DSR for the given network graph and identify the factors that contribute to selecting the shortest path. 	**10 Marks**	**L4**	**CO4**
	b.	In a Mobile IP network, a packet is routed from a Correspondent Node (CN) to a Mobile Node (MN) currently in a foreign network. Explain the process of IP packet delivery in Mobile IP. Include the role of Home Agent (HA), Foreign Agent (FA), and Care-of Address (COA).	**10 Marks**	**L3**	**CO4**

17.		Analyze the evolution of mobile communication technologies from 1G to 5G by examining their key features and technological advancements. Discuss how each generation addressed the limitations of its predecessor, and evaluate the resulting improvements in data speed, network capacity, and overall user experience	**20 Marks**	**L4**	**CO5**

Or

18.		Analyze how user mobility and propagation environments influence the effectiveness of mobile communication technologies across different generations (2G to 5G). Support your answer with relevant examples.	**20 Marks**	**L4**	**CO5**