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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

M.Tech. (First Semester) Regular Examinations, February – 2025

24MECPC11001 –Wireless and Mobile Communication

(ECE)

Time: 3 hrs | Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Difference between 4G and 5G.	CO1	K1
b. Recall frequency hopping.	CO2	K2
c. Define fast and slow fading.	CO3	K2
d. Explain the necessity of link budget.	CO4	K1
e. Write down the merits and demerits of Okumura's model.	CO2	K2

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions	Marks	CO #	Blooms Level
2. a. Describe the structure of the GSM network, highlighting the interfaces between its components.	5	CO1	K2
b. Discuss the key characteristics and features that differentiate 5G technology, including its higher data rates and lower latency.	5	CO1	K3
(OR)			
c. Write the various wireless data services available today.	5	CO1	K1
d. Explain how satellites contribute to wireless communication and their advantages in providing global connectivity.	5	CO1	K3
3.a. Illustrate the fundamental concept of a cellular system with a detailed block diagram.	5	CO2	K2
b. Define small-scale fading in wireless communication. Compare Rayleigh and Rician fading, explaining their causes, characteristics, and impact.	5	CO2	K4
(OR)			
c. Discuss the importance of interleaving in wireless communication systems and how it helps mitigate burst errors.	5	CO2	K4
d. Analyze the significance of angular scattering in beamforming optimization for millimeter-wave and massive MIMO systems.	5	CO2	K3
4.a. Provide an overview of the IS-95 (cdmaOne) system architecture.	5	CO3	K2
b. Compare the Slotted ALOHA and Pure ALOHA access schemes in terms of working principles and throughput performance.	5	CO3	K3
(OR)			
c. Define equalizers in communication receivers? Explain their role in mitigating channel distortions.	5	CO3	K2
d. Describe different multiple access techniques used in wireless communication with clear diagrams.	5	CO3	K3
5.a. Explain the working mechanism of the forward and reverse links in wireless communication systems.	5	CO4	K4

b.	How do various path loss models contribute to practical link budget design? Provide a detailed explanation.	5	CO4	K3
	(OR)			
c.	Discuss the key strategies used to enhance channel capacity and expand coverage in wireless networks.	5	CO4	K1
d.	Write short notes on: (a) Polarization and (b) Frequency diversity.	5	CO4	K2
6.a.	Differentiate between the physical and logical channels in the IS-95 (cdmaOne) system.	5	CO2	K3
b.	What are priority handoff techniques in cellular networks? Explain different methods.	5	CO1	K3
	(OR)			
c.	Consider a GSM system with frames containing 8 time slots, each slot consisting of 156.25 bits. Given a data rate of 270.833 kbps, calculate: (i) The time duration of a bit, (ii) The duration of a time slot, (iii) The total frame duration, (iv) The waiting time for a user between successive transmissions.	5	CO1	K1
d.	Compare and contrast three major multiple access techniques commonly employed in wireless communication.	5	CO3	K3

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