QP Code: RM23MTECH089 | Reg. No | | | | | | | | | | | AY 23

GIET UNIVERSITY, GUNUPUR – 765022

M. Tech (Second Semester) Examinations, May – 2024

MPCEC2030 - Advanced Communication Systems

(ECE)

Time: 3 Hrs | Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 10 = 20 Marks)**

Q.1. Answer all questions	CO#	Blooms Level
a. What are the key differences between analog and digital communication systems?	CO1	K2
b. Define Gram Schmidt Orthogonalization and its significance in communication systems.	CO1	K1
c. Define digital modulation techniques and provide examples.	CO1	K2
d. What is PCM and how does it differ from DPCM?	CO2	K3
e. What is WDM (Wavelength Division Multiplexing) and how does it enable increased data transmission capacity in optical fiber networks?	CO3	K2
f. Briefly explain SONET (Synchronous Optical Network) and its importance in high-speed data transmission.	CO3	K2
g. Discuss the essential elements in designing a satellite link to achieve a specified Carrier-to-Noise ratio (C/N).	CO4	K3
h. What is CDMA and how does it differ from FDMA and TDMA?	CO4	K1
i. What is Mobile Telephone Service (MTS), and what are its key characteristics?	CO2	K2
j. What is Quality of Service (QoS) in the context of mobile communication, and why is it important?	CO2	K1

PART – B **(10 x 5=50 Marks)**

Answer ***ANY FIVE*** questions	Marks	CO#	Blooms Level
2. a. Discuss the significance of signal space representation of waveforms in digital communication systems.	5	CO1	K3
b. How does the representation of signals differ in bandpass and lowpass domains? Provide real-world examples.	5	CO1	K2
3.a. Provide an in-depth explanation of memoryless digital modulation schemes such as PAM, ASK, PSK, and FSK. Highlight their respective advantages and disadvantages.	5	CO2	K3
b. Discuss the challenges of digital communication through band-limited channels and strategies for signal design to optimize transmission efficiency.	5	CO2	K4
4. a. Provide an overview of 3G systems, including their architecture, features, and improvements over previous generations of mobile telecommunications standards.	5	CO3	K5

b.	Discuss various link management protocols used in telecommunications networks, such as LACP and SNMP.	5	CO3	K3
5.a.	Discuss the principles of System Noise Temperature and G/T Ratio in satellite communication systems.	5	CO4	K3
b.	Explain the concept of Multiple Access with On-Board Processing in satellite communication systems.	5	CO4	K4
6. a.	Explore the architecture and functionalities of GPRS (General Packet Radio Service) in mobile communication networks	5	CO2	K5
b.	Discuss the phenomenon of fading in wireless communication systems, including its causes, effects, and techniques to mitigate its impact.	5	CO2	K3
7.a.	Explain the design of optimal receivers for AWGN channels and performance analysis for coherent and noncoherent communication systems.	5	CO1	K5
b.	Explain how information theory principles are applied in the design and analysis of communication systems.	5	CO1	K4
8. a.	Describe different switching techniques used in telecommunication networks and their roles in routing and managing network traffic.	5	CO3	K3
b.	Discuss wavelength division multiplexing (WDM) and time division multiplexing (TDM) techniques in telecommunication infrastructure.	5	CO4	K4

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