QP Code: SN22BTECH579 Reg. No | | | | | | | | | | | AR 21

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET University)

B. Tech (Seventh Semester - Regular) Examinations, November – 2025

22BECPE47011 – Mobile Communication

(ECE)

Time: 3 hrs Maximum: 70 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.	Find the cluster size of a cellular system in order to achieve maximum capacity, given path loss exponent of 3 and S/I of 15 dB is required for satisfactory forward channel performance of cellular system.	CO1	K2
b.	Differentiate time selective and frequency selective channel.	CO2	K1
c.	What do you mean by near-far effect in wireless communication?	CO1	K1
d.	Differentiate selection diversity and combining diversity.	CO3	K1
e.	Mention the IEEE standard of WiMAX, Wi-Fi, ZigBee.	CO4	K1

PART – B **(15 x 4 = 60 Marks)**

<u>Answer ***all*** the questions</u>		Marks	CO #	Blooms Level
2. a.	Prove that for a hexagonal geometry, the co-channel reuse ratio is given by $Q=\sqrt{3N}$, where $N= i^2 +ij+j^2$ using cosine law and the hexagonal cell geometry?	8	CO1	K2
b.	Explain Doppler shift with required mathematical expression.	7	CO2	K2
	(OR)			
c.	Explain signal fading statistics with suitable expression.	8	CO2	K1
d.	Explain base station system and network switching system in GSM network.	7	CO3	K2
3.a.	Derive the Signal to Interference in dB for a directional antenna (120 degree sectoring) in worst case scenario with suitable diagrams in a first-tier system.	8	CO1	K2
b.	Explain hand off technique with suitable diagram.	7	CO1	K1
	(OR)			
c.	Prove that in the two- ray ground reflected model $\Delta = 2ht*hr/d$. Write down path difference in terms of wavelength.	8	CO2	K2
d.	Discuss the salient features of CDMA and TDMA techniques.	7	CO2	K1
4.a.	Describe the parameters of mobile multipath channels.	8	CO2	K2
b.	Write short notes on (i) Comparison of WiMAX and LTE technology (ii) Bluetooth technology.	7	CO4	K1
	(OR)			
c.	Explain the block diagram of a simplified communication system using adaptive equalizer at the receiver.	8	CO4	K1
d.	Explain in detail the evolution of wireless communication.	7	CO1	K1
5.a.	If a GSM system uses a frame structure where each frame consists of 8 time slots, and each time slot contains 156.25 bits, and data is transmitted at 270.833 kbps in the channel, Calculate . (a) The time duration of a bit	8	CO2	K2

(b) The time duration of a slot

(c) The time duration of a frame

b.	With neat diagram explain TDMA frame architecture.	7	CO2	K1
	(OR)			
c.	Explain the general operating modes in adaptive equalizer.	8	CO3	K2
d.	Explain WLAN system architecture with neat diagram. Write down the WLAN requirements.	7	CO4	K1

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