SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations February-2024
WIRELESS COMMUNICATIONS
(Electronics & Communications Engineering)

Time: 3 Hours   Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

1	a	Discuss briefly about the evolution of Mobile radio communication.	CO1	L1	6M
	b	Tabulate list of terms used to describe various elements of wireless communication systems.	CO1	L1	6M

OR

2	a	Discuss how to improve the cellular capacity by decreasing the D/R ratio and by keeping the cell radius unchanged?	CO1	L2	6M
	b	Discuss the impact of adjacent channel interference on the system capacity.	CO2	L1	6M

UNIT-II

3	a	How the received signal strength is predicted using the free space propagation model? Explain?	CO3	L1	6M
	b	If a transmitter produces 50W of power, express the transmit power in units of dBm, dBW. If 50W is applied to a unity gain antenna with 900MHz carrier frequency, find the receiver power in dBm at a free space distance of 100m from the antenna. What is Pr (10 km)? Assume unity gain receiver antenna.	CO5	L4	6M

OR

4	a	Draw neat diagrams illustrating knife-edge geometry with appropriate Notations.	CO3	L2	6M
	b	Explain the dependence of surface roughness on the frequency and angle of incidence.	CO3	L2	6M

UNIT-III

5	a	Describe the factors influencing small scale fading in the radio propagation channel.	CO1	L2	6M
	b	The speed of the aircraft is 500km/hr and it is heading towards the airport control tower at an elevation of 25 degrees. The communication between the aircraft tower and the plane takes place at a frequency of approximately 128MHz. What is the expected Doppler shift of the received signal in positive and negative directions?	CO5	L4	6M

OR

6	a	Evaluate frequency selective fading due to Multipath time delay spread.	CO3	L4	6M
	b	If the coherence bandwidth is calculated as 100 kHz in the given radio channel of 900 MHz frequency, calculate the maximum symbol rate that can be transmitted over this channel that will suffer minimal intersymbol interference.	CO5	L4	6M

UNIT-IV

7	a	Explain about fundamentals of Equalization.	CO4	L2	6M
	b	Explain the basic structure of an adaptive equalizer with neat diagram.	CO4	L2	6M

OR

8	a	Explain about selection diversity and feedback diversity.	CO4	L2	6M
	b	Explain about maximal ratio combining and equal gain diversity.	CO4	L1	6M

UNIT-V

9	a	Explain the multiple access scheme for narrowband systems and ideband systems.	CO1	L2	6M
	b	Describe the features of the frequency division multiple access (FDMA) scheme	CO1	L2	6M

OR

10	a	Explain the operation of precoding and beamforming schemes.	CO6	L1	6M
	b	Illustrate transmit diversity and receive diversity with neat diagram.	CO4	L3	6M

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