Total number of printed pages: 2

D/V Semester/DECE502

2024

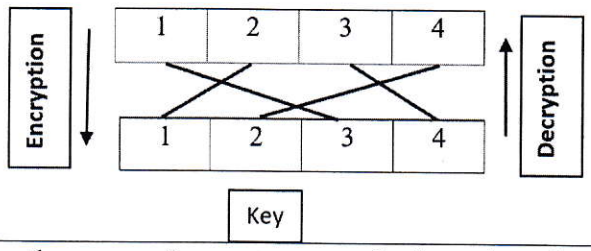
Mobile and Wireless Communication

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.		What is transposition cipher ? Encrypt the following: 1) Truth Alone Triumphs. And decrypt the following 1) WHYODGOUKLCOEFRAZXM, Using the provided key.  	20
2.		a) Define the spread spectrum technique in wireless communication. b) Explain the Frequency hopped Spread Spectrum (FHSS) technique with an example. c) With an example write a short note on PN sequence.	5+5+10
3		a) What is the difference between coaxial and twisted pair cable. How a twisted pair cable helps in reducing the external disturbances in communication. b) Draw a block diagram of fiber optic communication system explain the function of each component.	10+10
4.		Write down Snell's Law and define each term involved. Explain the concept of total internal reflection using Snell's Law. Provide a detailed explanation of the conditions required for total internal reflection to occur and illustrate with relevant diagrams.	20

		A microscope has an objective lens with a numerical aperture (NA) of 0.65. Determine the maximum angle of light rays that can enter the lens for effective illumination. Show all steps of calculation and provide a clear explanation of the process.	
5.		Compare TDMA, CDMA, and FDMA as multiple access techniques in wireless communication systems. Discuss their advantages, limitations, and application areas. Let's consider a TDMA system with 4 users sharing a single communication channel. The channel is divided into 4 equal time slots, and each user is allocated one time slot for transmitting data. The duration of each time slot is 10 milliseconds. User 1 transmits data during the first time slot, user 2 during the second time slot, user 3 during the third time slot, and user 4 during the fourth time slot. If each user has 1000 bits of data to transmit, and the transmission rate is 100 bits per millisecond, how long will it take for all users to transmit their data using TDMA?	10+10
6.		Explain the components of the GSM architecture in detail. Your answer should cover the following aspects and allocate marks accordingly: (1) Base Station Subsystem (BSS) (2) Network Switching Subsystem (NSS) (3) Operations and Maintenance Center (OMC) (4) Mobile Station (MS) (5) Home Location Register (HLR) (6) Visitor Location Register (VLR)	5+5+3+3+ 2+2

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