Quiz_2

Department of Computer Science and Engineering (CSE)

Daffodil International University

Student's ID: .... Program: .... Semester: ..... Year: .....

Course Code: .....Course Title: ..... Section: .....Date: 24-02-2025

Class Test No: 02 ..... Signature of the Course Teacher: ..... Set: D

Answer any one of the following questions.

Question 1

a) What are the differences between ***Data Element*** and ***Signal Element***? Explain it. 3.0

b) What is the **relation** between period & frequency? Explain it. 3.0

c) The period of a signal is 400 ms. What is its frequency in kilohertz? 2.0

d) A periodic signal has a bandwidth of 20 Hz. The highest frequency is 60 Hz. What is the ***lowest frequency***? ***Draw the spectrum*** if the signal contains all frequencies of the same amplitude. 3.0

e) We can calculate the theoretical highest bit rate of a regular telephone line. A telephone line normally has a bandwidth of 3000 Hz. The signal-to-noise ratio is usually 3162. Find out the ***channel the capacity***. 4.0

Question 2

a) Write down the ***three*** causes of impairment? *2.0*

b) What is ***attenuation***? Explain it with proper diagram. Suppose a signal travels through a transmission medium and its power is reduced to one-fourth. This means that P2 is (1/4) P1. In this case, the **attenuation** (loss of power) can be calculated. 2.5+3.5=6.0

c) What is ***decibel***? Explain it with mathematical function. 4.0

d) What is ***Latency***? Explain it. 3.0

Question 3

a) Line coding is a method of transforming digital data into digital signals that can be transmitted over a communication channel. Suppose you want to send the last three digits of your ID number. Evaluate and encode this data using the following line coding schemes? 6.0

i. AMI, ii. Pseudo-ternary, & iii. MLT3

b) What is ***Pulse Amplitude Modulation (PAM)***? Briefly analyze the steps involved in PAM. 6.0

c) What are the ***advantages*** & ***disadvantages*** of Serial and Parallel transmission. Explain it. 3.0