BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination: Quiz 2 **Semester: Summer 2023**
Duration: 15 minutes **Full Marks: 15**

CSE320: Data Communications

Name:	**ID:**	**Section:**

Answer the following questions on the question paper

Question 01: CO2 [5 x 3 = 15 Points]

a) Suppose we have a telephone line which operates at the frequency range from 300 Hz to 750 KHz. If the theoretical highest bit rate is about 30 MBps, then find out the **signal-to-noise ratio(SNR)**?
b) Assume that the information is given for a noiseless channel. **Calculate** the number of signal levels to represent the data.
c) A periodic signal has a bandwidth of 25 Hz. The highest frequency is 50 Hz. What is the lowest frequency? Draw the spectrum if the signal contains all frequencies of the amplitude of 10 volt.

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CSE320: Data Communications

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Answer the following questions on the question paper

Question 01: CO2 [5 x 3 = 15 Points]
Convert the following digital data stream to a digital signal by following the characteristics:

Data: 10110010

a. This **polar scheme** has self-synchronization issue for long sequence of 0's and DC problem.

b. This **bipolar scheme** has self-synchronization issue for long sequence of 0's but do not have a DC issue.

c. Apply a signal encoding technique where there will be no synchronization and DC issue but required more bandwidth.

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CSE320: Data Communications

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Answer the following questions on the question paper

Question 01: CO2 [5 x 3 = 15 Points]

d) Suppose we have a telephone line which operates at the frequency range from 200 Hz to 550 KHz. If the theoretical highest bit rate is about 15 MBps, then find out the **signal-to-noise ratio(SNR)**?

e) Assume that the information is given for a noiseless channel. **Calculate** the number of signal levels to represent the data.

f) A periodic signal has a bandwidth of 30 Hz. The highest frequency is 40 Hz. What is the lowest frequency? Draw the spectrum if the signal contains all frequencies of the amplitude of 10 volt.

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Examination: Quiz 3 **Semester: Summer 2023**
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CSE320: Data Communications

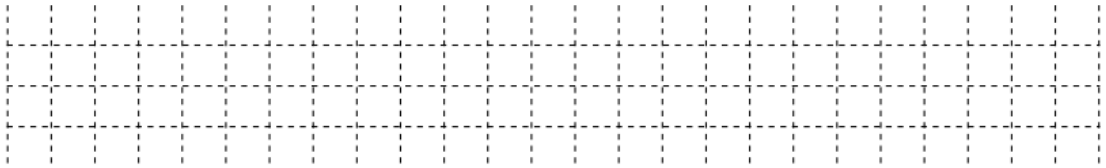
Name:	ID:	Section:

Answer the following questions on the question paper

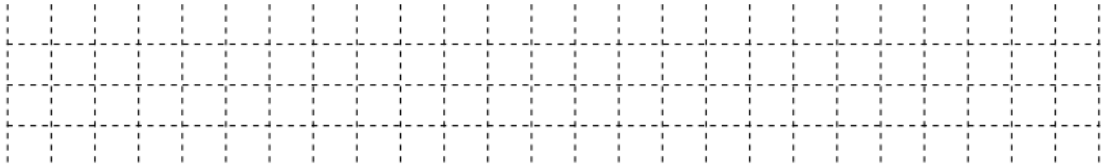
Question 01: CO2 [5 x 3 = 15 Points]
Convert the following digital data stream to a digital signal by following the characteristics:

Data: 01001101

a. This polar scheme has self-synchronization issue for long sequence of 0's and DC problem.



b. This bipolar scheme has self-synchronization issue for long sequence of 0's but do not have a DC issue.



c. Apply a signal encoding technique where there will be no synchronization and DC issue but required more bandwidth.