

ELEX 3525: Data Communications
2022 Fall Term

MIDTERM EXAM 2

11:30 – 12:20

Wednesday, November 2, 2022

SW01-2590

This exam has four (4) questions on one (1) pages. The marks for each question are as indicated. There are a total of sixteen (16) marks. Answer all questions. Write your answers and all rough work in this paper and nowhere else. Show your work. Draw a box around your final answer. Numerical answers must include units. Books and notes are allowed. No electronic devices other than calculators are allowed. **Show your work.**

This exam paper is for:

Sample Exam 1 A00123456

Each exam is equally difficult.

Answer your own exam.

Do not start until you are told to do so.

Name: _____

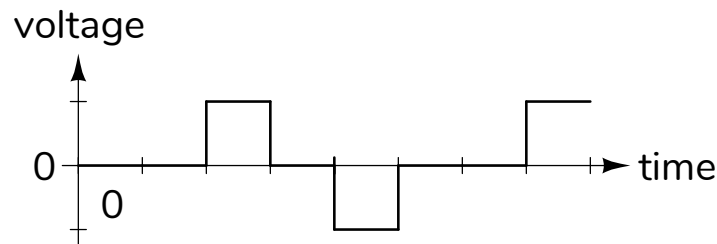
BCIT ID: _____

Signature: _____

Question 1

4 marks

The following waveform show 8 bits being transmitted using an MLT-3 line code. As shown, the first bit was a 1. What 8 bits were transmitted?



Question 2

4 marks

The following bytes, shown in hexadecimal, were transmitted using PPP framing. What are the values of the bytes within in the frame? Give your answer in hexadecimal and assume the conventions described in the lecture notes were followed, including that escaped bytes are xor'ed with 0x20.

7E 7D 7D 73 7D 5D 23 7D 1D 7E

Question 3

4 marks

You would like to generate a PRBS that does not repeat for at least two days (48 hours) when generating bits at 1 Mb/s. What is the minimum value of m (number of bits of generator state) required?

Question 4

4 marks

You wish to protect the message 10000 using a CRC whose generator polynomial is $1x^2 + 0x^1 + 1x^0$.

- What is the length of the CRC in bits?
- What are n , k and $n - k$?
- Compute the CRC using the simplified algorithm described in the lectures.

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This exam paper is for:

Sample Exam 2 A01234567

Each exam is equally difficult.

Answer your own exam.

Do not start until you are told to do so.

Name: _____

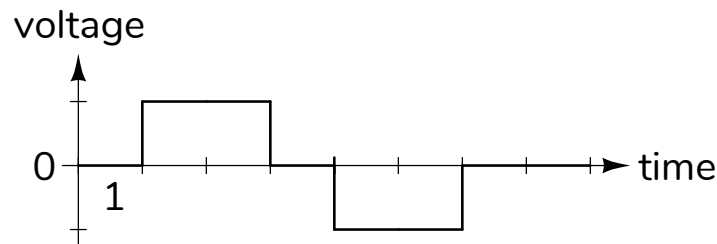
BCIT ID: _____

Signature: _____

Question 1

4 marks

The following waveform show 8 bits being transmitted using an MLT-3 line code. As shown, the first bit was a 1. What 8 bits were transmitted?



Question 2

4 marks

The following bytes, shown in hexadecimal, were transmitted using PPP framing. What are the values of the bytes within in the frame? Give your answer in hexadecimal and assume the conventions described in the lecture notes were followed, including that escaped bytes are xor'ed with 0x20.

7E 88 7D 1D 7D 5D 23 7D 7D 7E

Question 3

4 marks

You would like to generate a PRBS that does not repeat for at least one day (24 hours) when generating bits at 1 Mb/s. What is the minimum value of m (number of bits of generator state) required?

Question 4

4 marks

You wish to protect the message 11011 using a CRC whose generator polynomial is $1x^2 + 0x^1 + 1x^0$.

- What is the length of the CRC in bits?
- What are n , k and $n - k$?
- Compute the CRC using the simplified algorithm described in the lectures.