

MIDTERM EXAM 1  
10:30 AM – 11:20 AM  
Monday, October 28, 2019

This exam has two (2) questions on one (1) pages. The marks for each question are as indicated. There are a total of nine (9) 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 A00000000

Each exam is equally difficult.

Answer your own exam.

Do not start until you are told to do so.

Name: \_\_\_\_\_

BCIT ID: \_\_\_\_\_

Signature: \_\_\_\_\_

Question	Mark	Max.
1		6
2		3
Total		9

**Question 1****6 marks**

Draw the waveform that would be used by a typical asynchronous serial (“RS-232”) interface to transmit the 8-bit value 0x96 at 4800 bps using 8 bits per character and odd parity.

Label the voltage axis. Draw the waveform using the minimum valid voltages at the *transmitter*. Label the duration of one bit in units of microseconds.

**Question 2****3 marks**

A communication system transmits 7 different messages: spaces and six different digits (0 – 5). The probability of a space is 25%. All six digits are equally probable. What is the entropy of this source in units of bits per message?

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This exam paper is for:

Sample Exam 2 A000000000

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Name: \_\_\_\_\_  
BCIT ID: \_\_\_\_\_  
Signature: \_\_\_\_\_

Question	Mark	Max.
1		6
2		3
Total		9

**Question 1****6 marks**

Draw the waveform that would be used by a typical asynchronous serial (“RS-232”) interface to transmit the 8-bit value 0xA6 at 2400 bps using 8 bits per character and odd parity.

Label the voltage axis. Draw the waveform using the minimum valid voltages at the *transmitter*. Label the duration of one bit in units of microseconds.

**Question 2****3 marks**

A communication system transmits 7 different messages: spaces and six different digits (0 – 5). The probability of a space is 25%. All six digits are equally probable. What is the entropy of this source in units of bits per message?