

**MIDTERM EXAM 1**  
**10:30 AM – 11:20 AM**  
**Friday, October 14, 2021**

This exam has two (2) questions on one (1) pages. The marks for each question are as indicated. There are a total of fourteen (14) 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		8
Total		14

### Question 1

6 marks

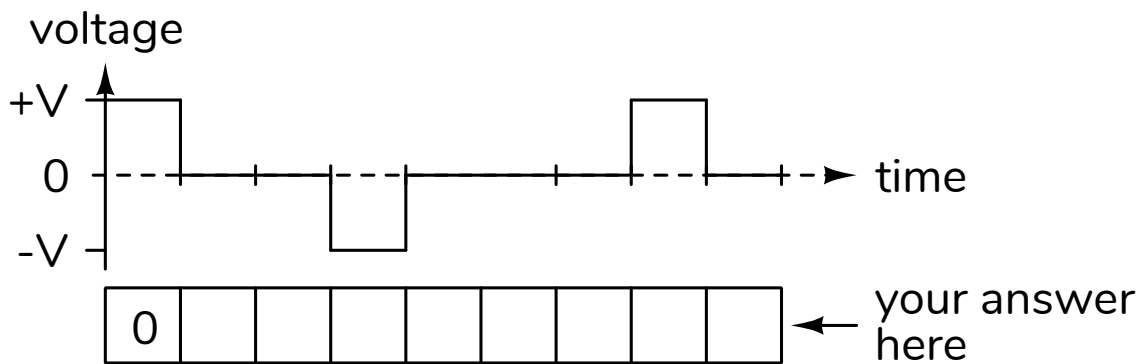
Draw the waveform that would be used by a typical asynchronous serial (“RS-232”) interface to transmit the 7-bit value 0x25 at 2400 bps using 7 bits per character and even parity.

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

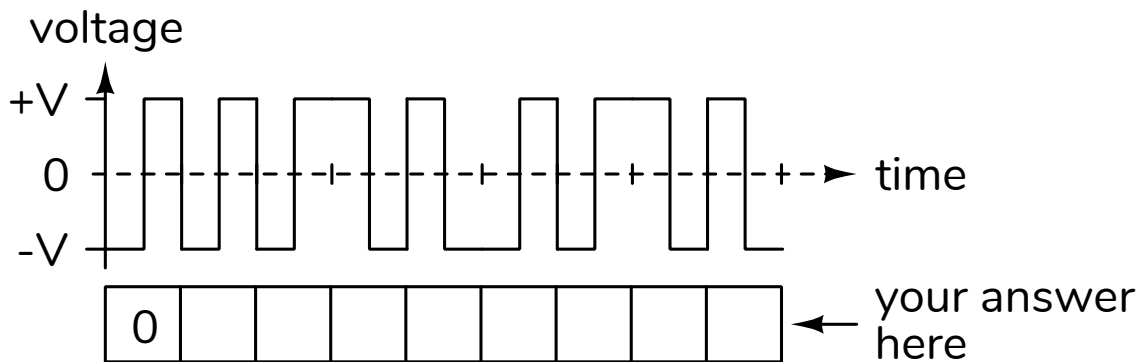
### Question 2

8 marks

- (a) The diagram below shows a data signal encoded using the MLT-3 line code. Fill in the boxes with the bit values that were being transmitted in each time interval.



- (b) The diagram below shows a data signal encoded using a *differential* Manchester line code following the conventions in the lecture notes. Fill in the boxes with the bit values that were being transmitted in each time interval.



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This exam paper is for:

**Sample Exam 2 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		8
Total		14

### Question 1

6 marks

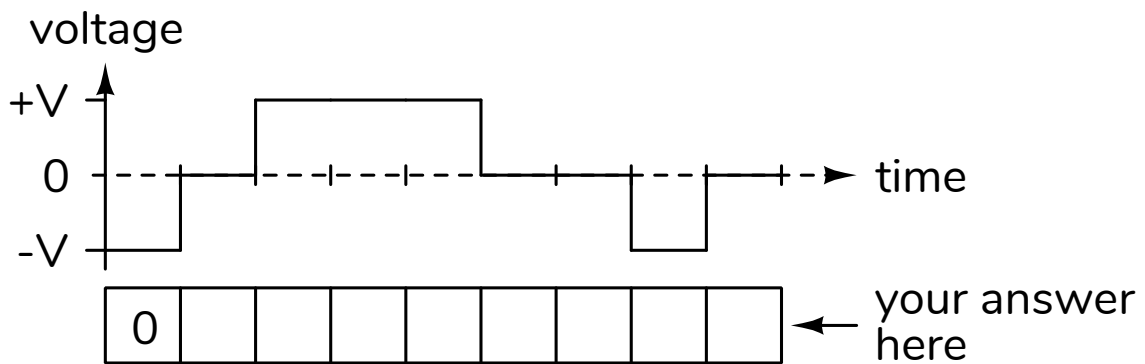
Draw the waveform that would be used by a typical asynchronous serial (“RS-232”) interface to transmit the 7-bit value 0x73 at 9600 bps using 7 bits per character and even parity.

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

### Question 2

8 marks

- (a) The diagram below shows a data signal encoded using the MLT-3 line code. Fill in the boxes with the bit values that were being transmitted in each time interval.



- (b) The diagram below shows a data signal encoded using a *differential* Manchester line code following the conventions in the lecture notes. Fill in the boxes with the bit values that were being transmitted in each time interval.

