ELEX 3525 : Data Communications
Term 201730

MID-TERM EXAMINATION # 2
1:30 PM – 2:20 PM
November 7, 2017

This exam has two (2) questions on six (6) pages. The marks for each question are as indicated. There are a total of 8 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:

Exam 1 A00123456

Each exam is equally difficult.
Answer your own exam.

Do not start until you are told to do so.

Name: _____

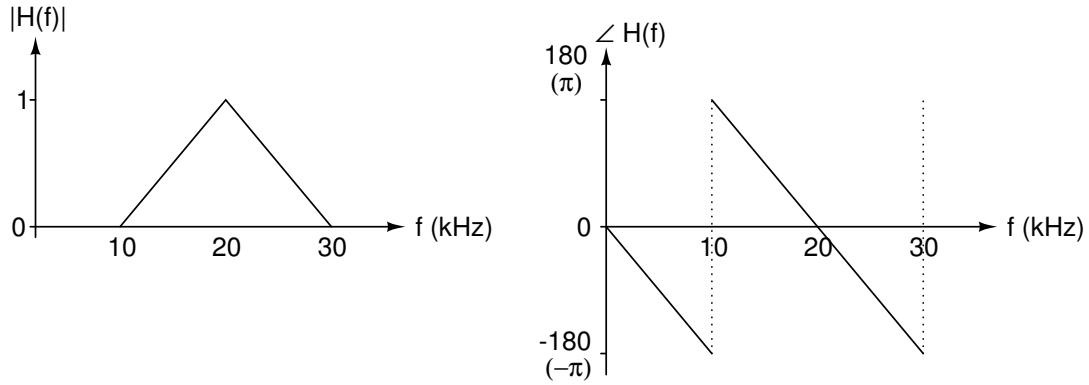
BCIT ID: _____

Signature: _____

Question	Mark	Max.
1		5
2		3
Total		8

Question 1 (5 marks)

The figure below shows the transfer function of a channel. The magnitude is shown in linear units (volts/volt) and the phase in degrees (and radians).



(a) What type of channel is this (*x*-pass)?

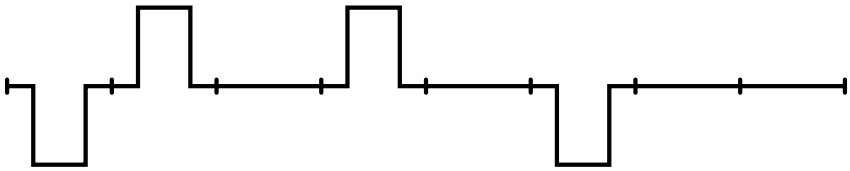
(b) What is the -6 dB bandwidth (in kHz)?

(c) What is the delay through the channel (in microseconds)?

(d) A 200 mV sinusoidal signal at a frequency of 15 kHz is applied to the input of the channel. (i) What is the output level (in millivolts)? (ii) What is the phase shift from the input to the output (in degrees)?

Question 2 (3 marks)

The following waveform shows a portion of an AMI-RZ-encoded data transmission.



(a) What bits were transmitted? Give your answer as 0's and 1's in the order the bits were transmitted.

(b) Were there any coding violations? If so, at which bit(s) (number the bits starting from 0)?

(c) If the bits represent a byte value transmitted in l.s.b.-first order, what value was transmitted? Give you answer in hexadecimal.

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Exam 2 A00123456

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Name: _____

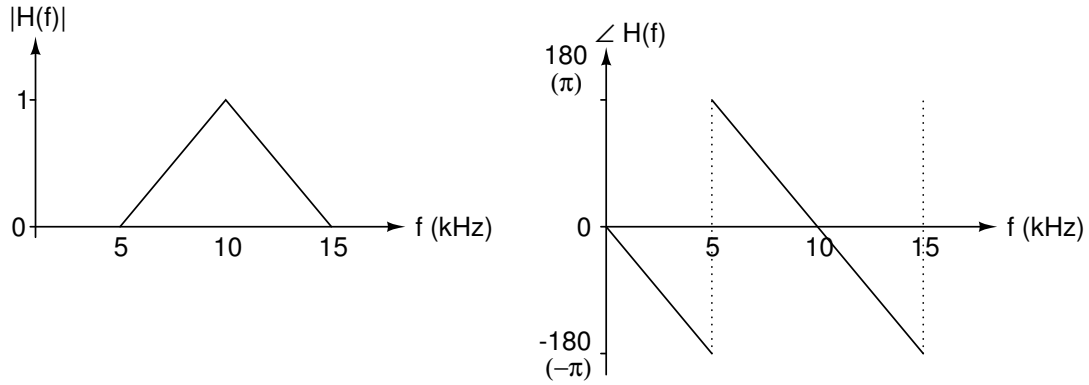
BCIT ID: _____

Signature: _____

Question	Mark	Max.
1		5
2		3
Total		8

Question 1 (5 marks)

The figure below shows the transfer function of a channel. The magnitude is shown in linear units (volts/volt) and the phase in degrees (and radians).



(a) What type of channel is this (*x*-pass)?

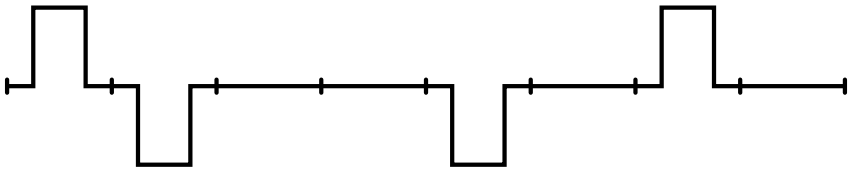
(b) What is the -6 dB bandwidth (in kHz)?

(c) What is the delay through the channel (in microseconds)?

(d) A 100 mV sinusoidal signal at a frequency of 7.5 kHz is applied to the input of the channel. (i) What is the output level (in millivolts)? (ii) What is the phase shift from the input to the output (in degrees)?

Question 2 (3 marks)

The following waveform shows a portion of an AMI-RZ-encoded data transmission.



(a) What bits were transmitted? Give your answer as 0's and 1's in the order the bits were transmitted.

(b) Were there any coding violations? If so, at which bit(s) (number the bits starting from 0)?

(c) If the bits represent a byte value transmitted in l.s.b.-first order, what value was transmitted? Give you answer in hexadecimal.

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