

ITS323 – Quiz 2

Name: _____ ID: _____ Marks: _____ (10)

Question 1 [3 marks]

Consider a signal transmitted in a noise-free channel, where the signal has 128 different possible signal elements. What is the required channel bandwidth to support a data rate of 70Mb/s? Show your calculations.

Question 2 [3 marks]

Select the most appropriate word/phrase from those listed below to fill in the blanks in the statements about data transmission.

bandwidth; data rate; cost; errors; bits; analog data; analog signals; analog transmission; digital data; digital signals; digital transmission

- (a) Increasing bandwidth results in increased data rate and _____.
- (b) A home, fixed telephone takes as input _____ and transmits _____.

Question 3 [4 marks]

Consider the general signal equation $s(t)$:

$$s(t) = \frac{A}{1} \sin(2\pi 1ft) + \frac{A}{3} \sin(2\pi 3ft) + \frac{A}{5} \sin(2\pi 5ft) + \dots + \frac{A}{N} \sin(2\pi Nft)$$

where N is an odd number.

If a signal with 5 components and bandwidth of 16MHz is used, then what is the period of $s(t)$? Show your calculations.