10.3 QUIZ INTRODUCTION

Consider a repetition code where codewords are formed by repeating each bit five times.

10.3 QUIZ QUESTION 1 (1/1 point)

What are the values of (n,k,d) for this code?

Please enter your answer in the form (n,k,d). For example, if n=k=d=1, enter `(1,1,1)`.

(5,1,5)

EXPLANATION

Each bit is transmitted individually, so the value of k=1.

The two possible code words are 00000 and 11111, thus n=5.

The Hamming distance between the two code words is d=5.

Thus, (n,k,d) = **(5,1,5)**.

Check Save Hide Answer *You have used 1 of 3 submissions*

10.3 QUIZ QUESTION 2 (1/1 point)

Suppose we wish to detect, but not correct errors in each received codeword. What is the maximum number of bit errors that we can detect?

Please key in the numerical value of your answer in the box provided below.

4

4

Answer: 4

EXPLANATION

The maximum number of bit errors we can detect, but not correct, is $d - 1 = 5 - 1 = 4$.

Check Save Hide Answer *You have used 1 of 3 submissions*

Help

10.3 QUIZ QUESTION 3 (1/1 point)

Suppose we wish to detect and correct errors in each received codeword. What is the maximum number of bit errors that we can detect and correct?

Please key in the numerical value of your answer in the box provided below.

2

2

Answer: 2

EXPLANATION

The maximum number of bit errors we can detect and correct is $\frac{d-1}{2} = \frac{5-1}{2} = 2$.

Check Save Hide Answer *You have used 1 of 3 submissions*

10.3 QUIZ QUESTION 4 (1 point possible)

Suppose we receive the following bitstream.

0000011110000111111011000111001111000001

If we assume that we can both detect and correct errors, what was the original bit stream?

Please enter your answer as a sequence of 0 and 1 bits with no spaces, e.g. 1100.

00000000100011100101

Answer: 01010110

EXPLANATION

Breaking the line above into individual 5 bit codewords, we obtain

00000 11110 00011 11110 11000 11100 11110 00001

Correcting errors by majority voting, we obtain

00000 11111 00000 11111 00000 11111 11111 00000

Thus, the original bit stream was **01010110**.

Hide Answer *You have used 3 of 3 submissions*

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