Winter_25_Quiz_7 - Results   ✕

Attempt 1 of 1

Written Mar 11, 2025 8:18 PM - Mar 11, 2025 8:36 PM

You successfully submitted your quiz.

Attempt Score	**9 / 14 - 64.29 %**
Overall Grade (Highest Attempt)	**9 / 14 - 64.29 %**

Question 1

Consider the following code words :

a) **1011011**
b) **0011100**

Do the code words show any signs of corruption? If yes, determine the
location of the corrupted bit and its correct value.

```
Data word    = abcd      x = a⊕b⊕d
Parity bits  = xyz       y = a⊕c⊕d
Codeword     = xyazbcd   z = b⊕c⊕d
```

a)
1011011
xyazbcd
x = 1 XOR 0 XOR 1 = 0 != 1

y = 1 XOR 1 XOR 1 = 1 != 0
z = 0 XOR 1 XOR 1 = 0 != 1

so the wrong bit is at:
1 + 2 + 4 = 7

it should be 1011010

b)
0011100
xyazbcd
x = 1 XOR 1 XOR 0 = 0 == 0
y = 1 XOR 0 XOR 0 = 1 != 0
z = 1 XOR 0 XOR 0 = 1 != 0

so the wrong bit is at:
2 + 4 = 5

it should be 0011000

The correct answer is not displayed for Written Response type questions.

▼   Hide question 1 feedback

Feedback

a)
codeword = 1011011
word = 1011
x = 0 wrong
y = 1 wrong
z = 0 wrong
corrupted bit = 1+2+4 = 7th bit
correct value = 1011010

b)
codeword = 0011100
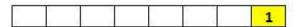word = 1100

x = 0 correct
y = 1 wrong
z = 1 correct
corrupted bit = 2nd bit
correct value = 0111100

Question 2

In a byte with even parity, how many 1s would be present if the parity bit is 1?

							1

1, 3, 5, 7 are possible since the total number of 1s needs to be even.

For example:
1: 00000011 <- parity bit => total number of 1s is 2
3: 00001111 <- parity bit => total number of 1s is 4
5: 00111111 <- parity bit => total number of 1s is 6
7: 11111111 <- parity bit => total number of 1s is 8

The correct answer is not displayed for Written Response type questions.

Question 3

What is the primary limitation of a single parity bit for error detection?

○ It requires too much memory.

○ It can detect and correct single-bit errors.

○ It slows down data transmission.

✓○ It can only detect single-bit errors.

Question 4

If two binary strings have a Hamming distance of 0, what does it indicate?

○ The strings have no bits in common.

✗ ○ The strings have different lengths.

○ The strings have one bit in common.

➡ ○ The strings are identical.

Question 5

For two binary strings of equal length, what is the maximum Hamming distance possible?

○ 0

➡ ○ The length of the strings

○ Twice the length of the strings

✗ ○ 1

Question 6

Considering the odd parity for the following codeword, the value of **P** is equal to:
P110110

○ 0

✓ ○ 1

Done