Assignment Title:  Error Correction Using Hamming Code

Given the Memory data =11010011

1. Find the 4 check bits which are going to be sent with the Memory data. (1 Mark)

0101

2)      Combine the Chick bits and the Memory data to form K. (1 Mark)

**K= 01011010011**

3)      After sending  K, find the  syndrome word in case the received K=  **110110010010**

(1 Mark)

Syndrome word = 10000

4) Find the exclusive or of the check bits:

C8 C4 C2 C1 1 0 0 0

⊕ C8 C4 C2 C1 ⊕1 0 1 1

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_

0 0 1 1 (1 Mark)

5) Which bit has an error? \_\_\_\_\_\_\_\_\_\_ (1 Mark)

Solution

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bit position | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| Data bits | D8 | D7 | D6 | D5 |  | D4 | D2 | D2 |  | D1 |  |  |
| Check bits |  |  |  |  | C8 |  |  |  | C4 |  | C2 | C1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| K: (Word stored as) | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| Word fetched as  110110010010 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Check bits |  |  |  |  | 1 |  |  |  | 0 |  | 1 | 1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

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