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)

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

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

(1 Mark)

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 | D3 | 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 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |