**Question No.1 10 Marks**

**NAME: SAQIB SALEEM**

**VU ID: BC210208252**

Given are the pairs of words in the following table.

You are required to mention the Hamming distance associated with each Pair of Words

|  |  |
| --- | --- |
| **Pair of Words** | **Hamming Distance** |
| *d* (10111,1100) | Inequal length |
| *d* (1101, 10101) | Inequal length |
| *d* (10100, 00010) | 3 |
| *d* (1110,0111) | 2 |
| *d* (010,10000) | Inequal length |

**Question No.2 5** **Marks**

Consider a sender station wants to send **“10111011010010111011010101110100”** data bits to a destination station. You are required to compute the 8-bit Checksum that the sender will send to destination along with original data bits. Write all necessary calculation steps**.**

**10111011010010111011010101110100**

the first step is to split the data bits into groups of 8 bits each. This gives us the following groups:

10111011

01001011

10110101

01111010

0

The next step is to add up the binary values of each group, including the padded group if applicable. This gives us the following sum:

10111011 + 01001011 + 10110101 + 01111010 + 0 = 011010111

The final is to take the one’s compliment (invert) the result from step 2. This gives us the following one’s compliment checksum:

011010111 -> 10010100

Therefore, the checksum for the given data bits is 10010100.