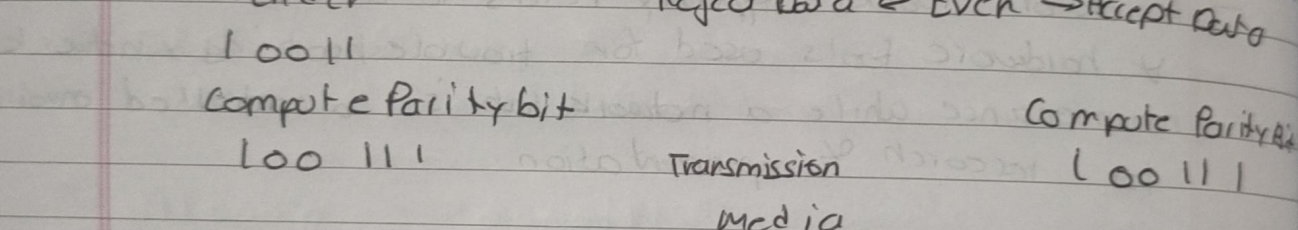
Experiment – 8

1) What is an Error? What are the types of error.
When the information received at the reciever end doesn't match the sender data - Error
Types of Errors:
1) Single bit error 2) Multiple-bit error 3) Burst error

2) Explain simple parity & 2 dimensional parity checks error detection with an example.
- Simple Parity Check:
It is a simple error detection method that involves adding an extra bit to data transmission.
It works as:
- 1 is added to the block if it contains an odd number of 1's
- 0 is added to the block if it contains an even no. of 1's



3) What is the difference between even & odd parity?
Parity of a number refers to whether it contains an odd or even number of 1-bits. The number has 'odd' parity if it contains an odd number of 1-bits & is 'even' if it contains an even number of 1-bits

4) Explain checksum method of error detection
In this error detection scheme the following procedure is applied
- Data is divided into fixed sized frames or segments
- The sender adds the segment using 1's compliment arithmetic to get the sum. It then compliments the sum to get the checksum & sends it along with the data frames.

- The receiver adds the incoming segments along with the checksum using 1's compliment arithmetic to get the sum & complements it.
- If the result is zero, the received frames are accepted otherwise they are discarded.

5) Explain CRC generator & CRC checker

CRC generator :-

CRC uses generator polynomial which is available on both sender & receiver side.

Cyclic Redundacy Checker (CRC) is a method of detecting accidental changes/errors in the communication channel.

CRC uses generator polynomial which is of the form like $x^3 + x + 1$

6) Discuss the concept of redundacy in error detection.

The concept of redundacy in error detection is a fundamental principle used in various fields, including digital ~~etc~~ comms. & data storage.

Redundacy involves adding extra information to the original data to provide a mean of detecting & in some cases correcting errors that may occur during data transmission or storage

7) For the message 11001 & divisor 101 find whether the number is accepted or rejected using CRC method of error detection

→

Receiver

```
101 | 11 00100
      101
      ---
       110
       101
       ---
        111
        101
        ---
        100
        101
        ---
         10
```

Message to be transmitted

```
11 00100
      10
---------
11 00110
```

```
101 | 11 00110
      101
      ---
       110
       101
       ---
        111
        101
        ---
        101
        101
        ---
         00
```

zero means accepted

8 Take any 4 8 digit numbers using checksum error detection find whether the number is accepted or not

11110000 00001111 11001100 00110011

Sender

```
11110000
00011111
--------
11101111
11001100
--------
1 11001011
        1
--------
11001100
00110011
--------
11111111
00000000
```

sum checksum

→ As 1's complement of sum is '0' on receiver's side the eno is accepted

Receiver

```
11110000
00001111
--------
11111111
11001100
--------
1 11001011
        1
--------
11001100
00110011
--------
11111111
00000000
```

checksum

sum complimento 00000000