

## EXPERIMENT- 1

**Object:** -Verification of 4-bit Binary Adder.

**Resources Required:**

1. TTL Trainer board.
2. Patch Cords.

**Theory:** -

A four bit binary adder is used to perform the function of binary addition involving 4 Bit binary number and obtained result is a 4 bit and if it is a 5 Bit number than MSB is separately shown.

A 4 Bit Binary adder performs addition of two 4 Bit binary number with an initial carry or without an initial carry.

**Procedure**

1. Switch on the kit.
2. Give input as A (first bit sequence of four bits) and B (Second bit sequence)with and without initial carry and note down the output.
- 3.Output should be same as shown as sum.

**Observation Table:** -

The following binary additions of two 4 Bit binary numbers were performed and are verified theoretically as well as experimentally.

1. (Without initial carry.)

(a)

```
  1111
  0111
10110  Sum
```

(b)

```
  1111
  1001
11000Sum
```

(c)

1111  
1011  
11010.Sum

(d)

1111  
1000  
10111Sum

(e)

1111  
1010  
11001Sum

(f)

1111  
1100  
11011Sum

(g)

1110  
1111  
11101Sum

(h)

1110  
1110  
11100Sum

(i)

1110  
1101  
11011Sum

(j)

1110  
1100  
11010Sum

(k)

1110  
1011  
11001Sum

(l)

1110  
1010  
11000Sum

2. (With initial carry 1.)

(a)

1  
1100  
1111  
11100Sum

(b)

1  
1100  
1110  
11011Sum

(c)

1  
1100  
1101  
11010Sum

(d)

1  
1100  
1100  
11001Sum

(e)

1  
1100  
1011  
11000Sum

(f)

1  
1100  
1010  
10111Sum

(g)

```
  1
1011
0001
1101Sum
```

(h)

```
  1
1011
0010
1110Sum
```

(i)

```
  1
1011
0011
1111Sum
```

(j)

```
  1
1011
0100
10000Sum
```

(k)

```
  1
1011
0101
10001Sum
```

(l)

```
  1
1011
0110
10010Sum
```

**Result:-**The four bit binary Adder is verified.