**FPGA LAB**

**ASSIGNMENT 1**

**NITISH PANI**

**INTEGRATED SENSOR SYSTEMS**

**ROLL NO:-IS21MTECH14007**

Q.6.

(a) Verify the following using Boolean Laws.

A+C = A+A'.C+B.C

Ans:-

To prove: A+C = A+A'.C+B.C

Proof: RHS= A+A'.C+B.C

As per redundancy rule,

A+A'.C = A+C

So the RHS translates to

A+C+BC

= A+C.(1+B)

=A+C=LHS

Hence proved.

Now taking the truth table followed by a three-variable K-map,

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | A+A'.C+B.C |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 |

Drawing a three-variable K-map from the truth table above:

BC

|  |  |  |  |
| --- | --- | --- | --- |
| 0 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 |

A

Grouping the 1’s in the above K-map into a rectangle and a square, we get the final expression as:

F(out)=A+C;