## Questions with answers for report writing:

1. What do you mean by universal gate?
2. What are the ICs required in this experiment?
3. Construct a circuit of output F, where F=AB + BC + CA, by using NAND gates only in the PSIM Software and show the output states for each of the available conditions.
4. A Logic Gate which can infer any of the gate among Logic Gates or a gate which can be used to create any Logic gate is called Universal Gate. **NAND** and **NOR** Gates are called Universal Gates because all the other gates such as NOT, AND, OR, XOR, XNOR etc can be created by using these gates.
5. ICs required for the experiment:

7400 : 1 pcs

7402 : 1 pcs

7404 : 1 pcs

7408: 1 pcs

7432 : 1 pcs

7486 : 1 pcs

1. F=AB + BC + CA = =

Truth Table:

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

Simulation:

A computer screen shot of a diagram

Description automatically generated

A computer screen shot of a diagram

Description automatically generatedA=0, B=0, C=0, F=0

A=0, B=0, C=1, F=0

A computer screen shot of a diagram

Description automatically generatedA=0, B=1, C=0, F=0

A computer screen shot of a diagram

Description automatically generated

A=0, B=1, C=1, F=1

A computer screen shot of a diagram

Description automatically generatedA=1, B=0, C=0, F=0

A computer screen shot of a diagram

Description automatically generated

A=1, B=0, C=1, F=1

A computer screen shot of a diagram

Description automatically generated

A=1, B=1, C=0, F=1

A computer screen shot of a diagram

Description automatically generated

A=1, B=1, C=1, F=1