

**Name: Preetam Kumar**

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**Subject: Digital Logic Design**

**Instructor: Sir Rafay Shaikh**

**Q: 1** which gates are categorized as universal gates and how are they used?

**Ans:** A universal gate is a gate which can implement all other gates OR, AND, NOTwithout need to use any other gate type. There are two universal gates.

**1.** NAND Gate

**2.** NOR Gate

**Q: 2** Verify the truth table of ANDgate and ORgate.

Truth table for AND gate:

|  |  |  |
| --- | --- | --- |
| A | B | Y |
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

Truth table for OR GATE**:**

|  |  |  |
| --- | --- | --- |
| A | B | Y |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |

**Q: 3** Verify the truth table of NORgate and NANDgate.

Truth table for NAND GATE:

|  |  |  |
| --- | --- | --- |
| A | B | Y |
| 0 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

Truth table for NOR GATE:

|  |  |  |
| --- | --- | --- |
| A | B | Y |
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 0 |

**Q: 4** Verify the truth table of **XOR** gate and **XNOR**

Truth table for XOR GATE:

|  |  |  |
| --- | --- | --- |
| A | B | Y |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

Truth table for XNOR GATE:

|  |  |  |
| --- | --- | --- |
| A | B | Y |
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

**Q: 5** Convertthefollowing logic gate into a Boolean expression, writing Boolean sub-expression next to each gate output in the diagram.

**Ans:** (A+B)\*C

**Q: 6** Draw the following function in circuit maker.

1. **F = X’YZ + X’YZ’ + XZ**
2. **F = X’Z + XY’Z + YZ’**

**THANK YOU**