# BASIC LOGIC GATES

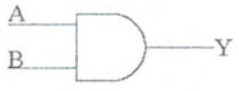
## *Experiment No. 01*

***Aim:*** *To implement AND, OR, NOT, NAND, NOR, and XOR gates using TTL ICs.*

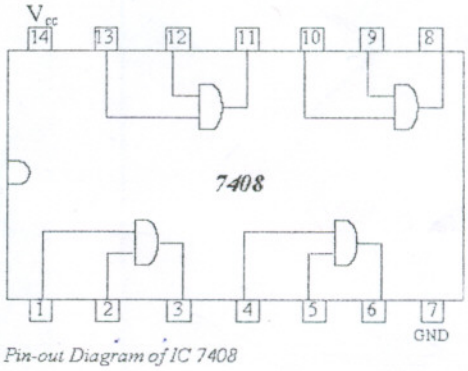
Let inputs to a gate are A & B and Y is the output.

This experiment serves as an introduction to the 'Bread-Boards' used in the laboratory and to understand the function of various TTL ICs.

***Activity-1.*** Implementation of Logic AND Gate using IC 7408




*Logic Diagram of AND gate*




*Pin-out Diagram of IC 7408*

*Observations*

(i) What is the number of AND gates in the IC 7408 ..... .....

(ii) Complete & Verify the 'Truth-Table' for any one of the four AND gates.

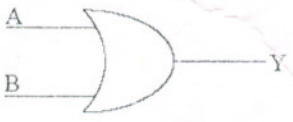
*Truth-Table: 'AND Gate'*

| *Inputs* | | *Outputs* |
|---|---|---|
| *A* | *B* | *Y* |
| 0 | 0 | |
| 0 | 1 | |
| 1 | 0 | |
| 1 | 1 | |

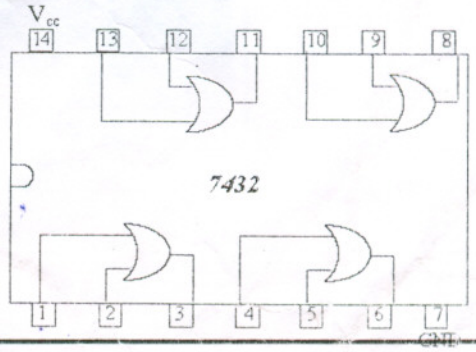
(iii) With the help of the above 'Truth-Table' write the 'Switching Expression's ..... .

.....

***Activity-2.*** Implementation of Logic OR Gate using IC 7432




*Logic Diagram of OR gate*




*Pin-out Diagram of IC 7432*

*Observations*

(i) What is the number of OR gates in the IC 7432 .....

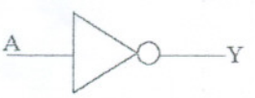
(ii) Complete & Verify the 'Truth-Table' for any one of the four OR gates.

*Truth-Table: 'OR Gate'*

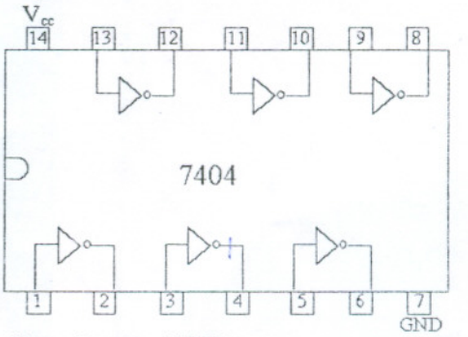
| *Inputs* | | *Outputs* |
|---|---|---|
| *A* | *B* | *Y* |
| 0 | 0 | |
| 0 | 1 | |
| 1 | 0 | |
| 1 | 1 | |

(iii) With the help of the above 'Truth-Table' write the 'Switching Expression's ..... ...

***Activity-3***. Implementation of Logic NOT Gate using IC 7404




*Logic Diagram of NOT gate*




*Pin-out Diagram of IC 7404*

*Observations*

(i) What is the number of NOT gates in the IC 7404 .....

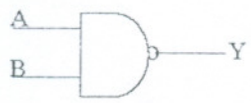
(ii) Complete & Verify the 'Truth-Table' for any one of the six NOT gates.

*Truth-Table: 'NOT Gate'*

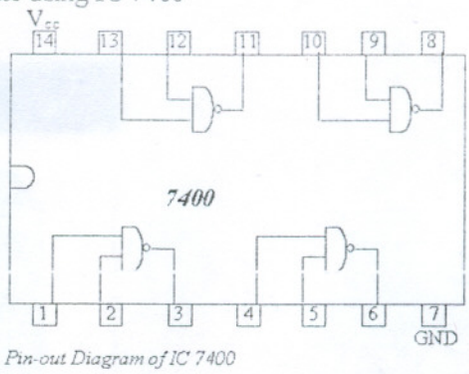
| *Inputs* | *Outputs* |
|---|---|
| A | Y |
| 0 | |
| 1 | |

(iii) With the help of the above 'Truth-Table' write the 'Switching Expression's ..... ...

***Activity-4.*** Implementation of Logic NAND Gate using IC 7400




*Logic Diagram of NAND gate*




*Pin-out Diagram of IC 7400*

*Observations*

(i) What is the number of NAND gates in the IC 7400 .....

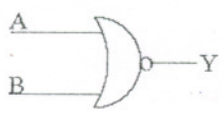
(ii) Complete & Verify the 'Truth-Table' for any one of the four NAND gates.

*Truth-Table: 'NAND Gate'*

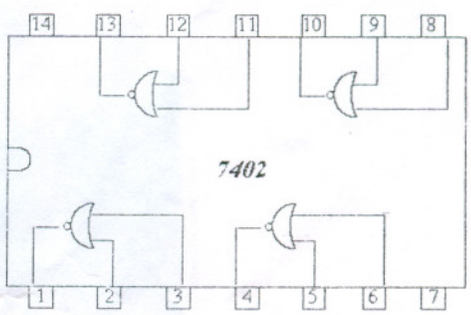
| *Inputs* | | *Outputs* |
|---|---|---|
| *A* | *B* | *Y* |
| 0 | 0 | |
| 0 | 1 | |
| 1 | 0 | |
| 1 | 1 | |

(iii) With the help of the above 'Truth-Table' write the 'Switching Expression's ..... .....

***Activity-5.*** Implementation of Logic NOR Gate using IC 7402




*Logic Diagram of NOR gate*




*Pin-out Diagram of IC 7402*

*Observations*

(i) What is the number of NOR gates in the IC 7402 .....

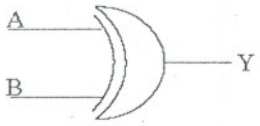
(ii) Complete & Verify the 'Truth-Table' for any one of the four NOR gates.

*Truth-Table: 'NOR Gate'*

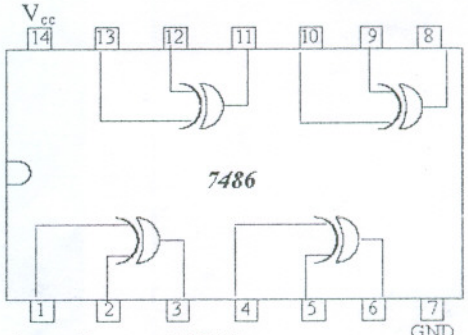
| *Inputs* | | *Outputs* |
|---|---|---|
| *A* | *B* | *Y* |
| 0 | 0 | |
| 0 | 1 | |
| 1 | 0 | |
| 1 | 1 | |

(iii) With the help of the above 'Truth-Table' write the 'Switching Expression's ..... ...

***Activity-6.*** Implementation of Logic XOR Gate using IC 7486




*Logic Diagram of XOR gate*




*Pin-out Diagram of IC 7486*

*Observations*

(i) What is the number of XOR gates in the IC 7486 .....

(ii) Complete & Verify the 'Truth-Table' for any one of the four XOR gates.

*Truth-Table: 'XOR Gate'*

| *Inputs* | | *Outputs* |
|---|---|---|
| *A* | *B* | *Y* |
| 0 | 0 | |
| 0 | 1 | |
| 1 | 0 | |
| 1 | 1 | |

(iii) With the help of the above 'Truth-