

BILASPUR UNIVERSITY

SESSION- 2017-18



BILASPUR

MSc FINAL

PROJECT-DEMULTIPLEXER

Roll:

No:

Reg no: BUS/15/420045/106

**Government Gramya Bharati College,
Hardibazar**

DECLARATION BY CANDIDATE

I hereby declare that the project entitled Design 1 to 4 Demultiplexer using IC and represent the result in a table Has been conducted by me.

Bratati Karan

Name of the candidate

Bratati Karan

M.Sc. final (Physics)

Enrollment No. BUS/15/420095/1106

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Dr. K.K. Dubey

Dr. K.K. Dubey
27/12/18

Dr. K.K. Dubey

Supervisor

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ACKNOWLEDGEMENT

I am grateful to my supervisor Dr. K.K. DUBEY for his active help, guidance and advice during this project work

I am also thankful to Mr. SHAHU the lab assistance and other person included with college laboratory for their suggestion, advice, encouragement to carry out the project work.

It will be unjust if any gratefulness is not extended to the non-teaching employees of the department, who helped me in different technical work to complete this project work.

My special thanks to Miss SHILPA YADAV and my beloved friends for encouraging me during this project work

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PREFACE

An experimental project work constitutes a part of the Under Post Graduate (P.G) Physics Honours Curriculum for the Final year of the Bilaspur University(C.G).

INTRODUCTION

Electric circuits can be classified into two broad groups- analog and digital. The analog circuits handle continuous signals. In single voltage at any instant is important. On the other hand, digital circuit handle binary signals which have only two distinct levels – either a low voltage or a high voltage spread over certain ranges. Here absolute value of the signal voltage is not important. In positive level logic system, if a voltage is more positive and is within a certain range (usually $4\text{v} \pm 1\text{v}$) then it is taken as '1' state. The other voltage which is relatively low and is within a certain range (usually $0.2 \pm 0.2\text{v}$) is considered as '0' state. In a negative level logic, then more negative voltage positive as the '0' state.

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➤ Theory:

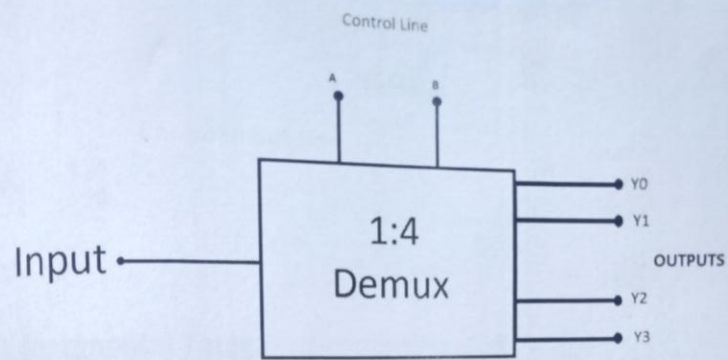
A Demultiplexer (DEMUX) performs the reverse operation of multiplexer. It is a logic system with one input and many outputs. Its function is to transmit input binary signal to one particular output line with the help of select input. For this the demultiplexer is also known as data distributor. Demultiplexers are available with 4, 8 or 16 outputs. The device is available as an MSI IC. It can also be designed by using the basic gates. By changing the control word AB the input data I can be routed to the output D_n where n is the decimal number represented by the binary string AB . For example, if $A=1, B=0$ then the gate G_2 is enabled and I is transmitted to the output D_2 . Symbolically we can write $D_0 = \bar{A}\bar{B}I$, $D_1 = \bar{A}BI$, $D_2 = A\bar{B}I$ and $D_3 = ABI$.

For 2^N output lines N select lines will be required. The device can be conveniently used for the design of combinational circuits. It is particularly useful if multiple output combinational circuit is to be designed.

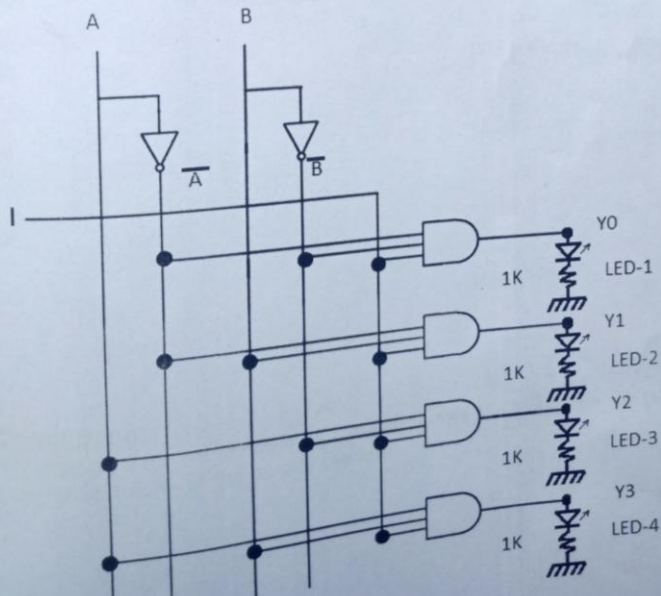
➤ Apparatus:

- i) Bread-Board - 1 Piece
- ii) IC-7404, IC-7411
- iii) LED-4 Pieces
- iv) Resistance $1\text{ k}\Omega$ - 4 Pieces
- v) Power Supply - 5V

➤ Block Diagram of 1:4 Demultiplexer:



➤ Circuit Diagram:



➤ Truth Table:

Table -I

Control Input Line		Output
A	B	Y
0	0	Y0=1
0	1	Y1=1
1	0	Y2=1
1	1	Y3=1

➤ Experimental Table:

Table-II

Input	Select Line		Output	Remarks
	A	B	Y	
I 5V	0	0	LED-1 Glows	Input Data is transmitted to Output Y0
5V	0	5	LED-2 Glows	Input Data is transmitted to Output Y1
5V	5	0	LED-3 Glows	Input Data is transmitted to Output Y2
5V	5	5	LED-4 Glows	Input Data is transmitted to Output Y3

➤ Conclusion:

Depending on the combination in two select lines the input data will be transferred to one of the output channel

➤ **Precaution and Discussion:**

(i) Implementation of digital gates by using IC is more popular than their implementation by using discrete circuit components. This is due to low cost, small size, low power requirement and improved performance of ICs.

(ii) NAND and NOR gates are called universal building blocks because the basic gates OR, AND, and NOT can be constructed by using NAND or NOR only.

(iii) While connecting the +5V dc supply to the ICs, special care should be taken. Connection to any pin may damage the IC.