Expt. No. 7 Date

Page No. 33

Aim of the Experiment:

To design digital MULTIPLEXER and DEMULTIPLEXER.

Apparatus Required:

S. No	Apparatus Required	Specification	Quantity
1	IC- (MUX)	74153, 74157, 74151	1
2	IC(D-MUX)	74155	1
3	Patching chords		As Required

Theory:-

MULTIPLEXER

A MULTIPLEXER is a device that allows digital information from several sources to be routed onto a single line for transmission over the line to a common destination. The basic multiplexer has a several data-input lines and a single output line. It also has data-select inputs, which permits digital data on any one of the inputs to be switched to the output line. Multiplexer known as DATA SELECTOR.

2:1 Multiplexer:

i) 2 data inputs (A, B)
ii) 1 select lines (SEL)
iii) 1 output line (Q)

Truth table:

	INPUTS			OUTPUTS
	SEL	A	B	Q
1	X	X	X	0
0	0	0	0	0
0	0	1	0	0
0	1	X	0	0
0	1	1	1	1

Teacher's Signature

Date

Expt. No. Page No. 35

4:1 Multiplexer:

i) 4 data inputs (D_0, D_1, D_2, D_3)

ii) 2 select lines (A_0, A_1)

iii) 1 output line (Q)

Truth table

INPUTS			OUTPUTS
	A1	A0	Q
1	X	X	0
0	0	0	D_0
0	0	1	D_1
0	1	0	D_2
0	1	1	D_3

8:1 Multiplexer:

i 8 data inputs ($D_0, D_1, D_2, D_3, D_4, D_5, D_6, D_7$)

ii 2 select lines (S_0, S_1, S_2)

iii 1 output line (Q or

Truth Table

INPUTs				OUTPUTs	
S_2	S_1	S_0		Q	
X	X	X	1	0	1
0	0	0	0	D_0	
0	0	1	0	D_1	
0	1	0	0	D_2	
0	1	1	0	D_3	
1	0	0	0	D_4	
1	0	1	0	D_5	
1	1	0	0	D_6	
1	1	1	0	D_7	

Expt. No. Page No. 37

DEMULTIPLEXER :

A demultiplexer performs the reverse operation of multiplexing function. It takes digital information form one line and distributes it to a given number of output lines depending upon the select lines.

1:16 D-Mux :

It has 2 enable inputs ( )
16 output line (
4 select lines (A_3, A_1, A_2, A_3)

Truth Table

INPUTS						OUTPUTS
A3	A2	A1	A0			Q = L
X	X	X	X	1	1	...
0	0	0	0	0	0	Q_0
0	0	0	1	0	0	Q_1
0	0	1	0	0	0	Q_2
0	0	1	1	0	0	Q_3
0	1	0	0	0	0	Q_4
0	1	0	1	0	0	Q_5
0	1	1	0	0	0	Q_6
0	1	1	1	0	0	Q_7
1	0	0	0	0	0	Q_8
1	0	0	1	0	0	Q_9
1	0	1	0	0	0	Q_{10}
1	0	1	1	0	0	Q_{11}
1	1	0	0	0	0	Q_{12}
1	1	0	1	0	0	Q_{13}
1	1	1	0	0	0	Q_{14}
1	1	1	1	0	0	Q_{15}

Teacher's Signature

Date

Expt. No. _____ Page No. 39

Procedure (D-MUX) :

1. Switch ON the supply of the trainer kit.
2. Identify the 2 bit binary De-Multiplexer IC 74155 on the trainer kit.
3. Rig° the circuit as shown in the below circuit diagram and verify the truth table.
4. First make the STR pin-2 as low bit from the data switch.
5. Second make the DATA INPUT A & B pin-13 & 3 as shown in the truth table.
6. Third the output put Q_0, Q_1, Q_2, Q_3 pin-9, 10, 11, 12 is given to the logic indicator.
7. Then the output is verified with the truth table given below.

Conclusion :

From the above experiment we conclude that:

a) With depending on the different combinations of the select lines we get different data at output of the MUX ~~and~~ or D-MUX.

b) MUX and D-MUX will generate the output when the corresponding ENABLE line is active otherwise it remain static(X).