# EXPERIMENT NO.: - 5

**AIM*:***To study the operation of multiplexer circuit.

**THEORY:**

A multiplexer is a MSI logic circuit capable of selecting single input bit from a number of different inputs and routing the selected bit to a single output. The bit selected is determined by the appropriate input address lines. For instant a multiplexer having three data select lines A, B, C is capable of selecting one of the eight possible input bits (i.e. D0 to D7). Here IC 74151 is used which is eight bit multiplexer. The connection diagram and truth table are shown in respective figures.

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| --- | --- | --- | --- | --- | --- |
| **INPUTS** | | | | **OUTPUTS** |  |
| **SELECT** | | | **STROBE**  **G’** | **Y** | **W** |
| **C** | **B** | **A** |
| X | X | X | H | L | H |
| L | L | L | L | D0 | D0’ |
| L | L | H | L | D1 | D1’ |
| L | H | L | L | D2 | D2’ |
| L | H | H | L | D3 | D3’ |
| H | L | L | L | D4 | D4’ |
| H | L | H | L | D5 | D5’ |
| H | H | L | L | D6 | D6’ |
| H | H | H | L | D7 | D7’ |

**EQUIPMENT REQUIRED:**

-Trainer kit

**COMPONENTS REQUIRED:**

**-**ICs 74151.

**-**Hook up wires.

**PROCEDURE:**

1. Switch ON the power supply.
2. Set inputs (D0 to D7) at high level or at low level as desired.
3. Set STR to low level.
4. Set three data select lines A, B, C at any value as per truth table ( say A = Low, B= High , C= Low i.e. 010 i.e. decimal 2 as per column no. 4)
5. Multiplexer will select D2 input at Y output terminal.
6. Check the truth table for different value of data select lines A, B, C mentioned in the truth table and checks the selected input Y appears at output.
7. If the level of strobe is changed to high level at any point, Y output will be only at low level irrespective of any position of A, B, C.

**OBSERVATIONS:**

**CONCLUSION:**

# EXPERIMENT NO.: - 6

**AIM:** To study the operation of de-multiplexer circuit.

**THEORY:**

A demultiplexer is a MSI logic circuit capable of routing data from a single source to one of a number of possible destinations the data bits are applied at the enable inputs and they appear at an output specified by the address inputs A0, A1,A2.

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| **Untitled4** |

Here IC 74138 is used which decodes one of eight lines based upon the conditions at the three binary select inputs and the three enable inputs. The connection diagram and function table are shown below.



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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| INPUTS | | | | | OUTPUTS | | | | | | | |
| ENABLE | | SELECT | | |
| G1 | G2 | C | B | A | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 |
| X | H | X | X | X | H | H | H | H | H | H | H | H |
| L | X | X | X | X | H | H | H | H | H | H | H | H |
| H | L | L | L | L | L | H | H | H | H | H | H | H |
| H | L | L | L | H | H | L | H | H | H | H | H | H |
| H | L | L | H | L | H | H | L | H | H | H | H | H |
| H | L | L | H | H | H | H | H | L | H | H | H | H |
| H | L | H | L | L | H | H | H | H | L | H | H | H |
| H | L | H | L | H | H | H | H | H | H | L | H | H |
| H | L | H | H | L | H | H | H | H | H | H | L | H |
| H | L | H | H | H | H | H | H | H | H | H | H | L |

**EQUIPMENT REQUIRED:**

-Trainer kit

**COMPONENTS REQUIRED:**

**-**ICs 74138.

**-**Hook up wires.

**PROCEDURE:**

1. Switch ON the power supply.
2. Set G1, G2A and G2B at low level.
3. Set inputs C, B, A at low level.
4. All output must be at high level ( i.e. all LED should glow - condition no.2)
5. Set G1, G2A and G2B at high level & inputs C, B, A as it is i.e. at low level.
6. All output must be at high level (i.e. all LED should glow – condition no.1)
7. Set G1 at high level and G2A and G2B at low level.
8. Set C, B, A at any different levels and check the outputs as per truth table, for example, if you adjust C, B, A to 0 1 0 , the output Y2 only will be low, others will be at high level – condition no.5.

**OBSERVATION:**

**CONCLUSION:**