

pre-Lab

Experiment No. 3 - Encoders,  
Decoders, Multiplexers, and  
Demultiplexers Logic Circuits.

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Q1) Design a circuit which uses an SN74151 to implement a sum-of-products expression, as follows:

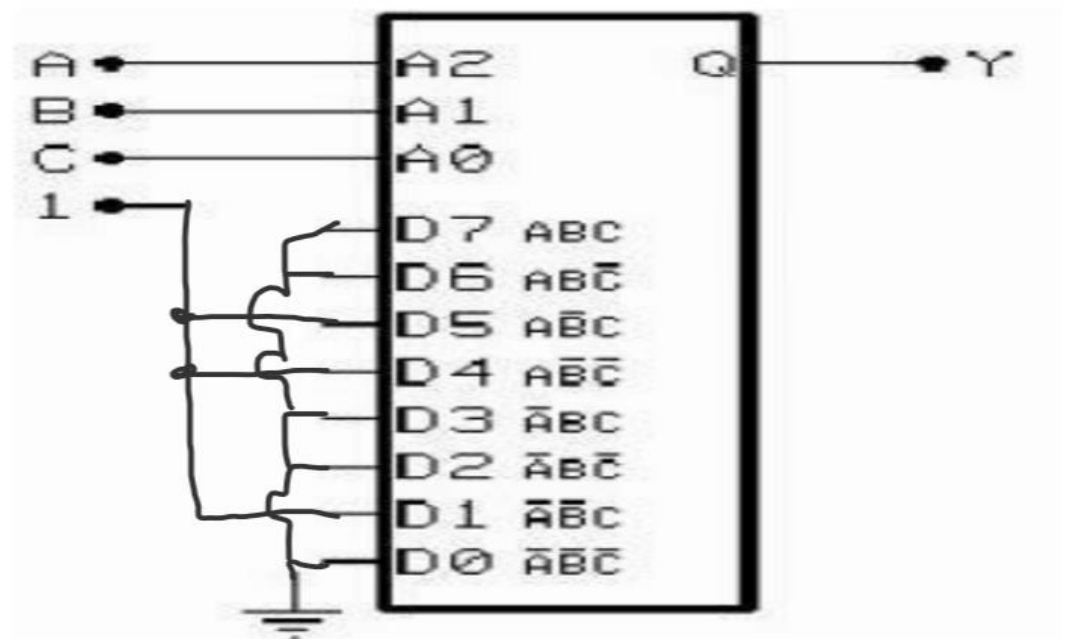
Convert the following expression into summation form (i.e.,  $F(A, B, C) = \sum (...)$ ):  $Y = f(A, B, C) = AB' + B'C$

$$F = AB'C + AB'C' + AB'C + A'B'C$$

$$F = \sum (1, 4, 5)$$

Inputs			Outputs
A	B	C	X
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

b) Sketch on Figure 3.1 the input connections necessary to implement the function in part (a). Observe that the inputs are connected to 0 or 1 depending on the value of the function for that min term.



Q2) Design a circuit which uses an SN74138 Demultiplexer to implement a sum- of-products expression, as follows: a) Convert the following expression into summation (Sum of Products –SOP-) form (i.e.  $F(A,B,C)=\sum (...)$ ):  $Y = f(A,B, C) = A'BC + BC'$

$$F=A'BC+ABC'+A'BC'$$

$$\underline{F} = \sum(2,3,6)$$

