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### 3.3 Pre Lab

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

a) Convert the following expression into summation form (i.e.,  $F(A, B, C) = \sum (...)$ ):

$$Y = f(A, B, C) = AB + BC$$

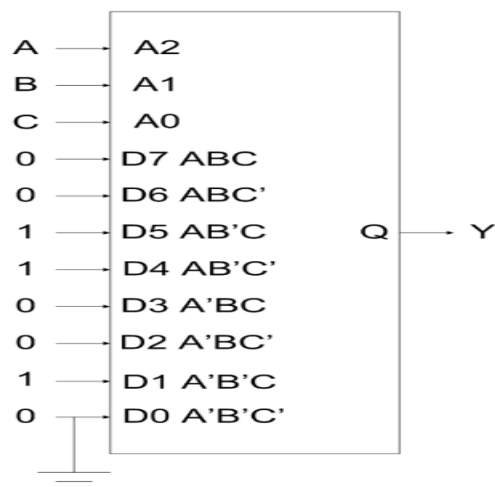
$$F(A, B, C) = AB'(C+C') + (A+A')B'C$$

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

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

A	B	C	F
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).



2) 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.

$F(A,B,C)=\sum(...)$ ):

$$Y = f(A,B, C) = \bar{A}BC + BC'$$

$$Y = A'BC + BC'$$

$$Y = A'BC + BC' = A'BC + (A+A') BC'$$

$$Y = A'BC + ABC' + A'BC'$$

$$Y = \sum (2, 3, 6)$$

