INF1400- Uke 02

1. Simplify the following Boolean expressions to a minimum number of literals:
(a) $xyz + xy' + xyz'$
(b) $(xy+z)(x+y')$
(c) $A'C' + A(BC + C')$

2. Find the complement of the following expressions:
(a) $D(AC + B')+BC$
(b) $(A+B'+C)(A'+B+D)(B+C+D')$

3. Simplyfy the following Boolean expressions to a minimum number of literals:
(a) ABC + A'B + ABC'
(b) (x+y)'(x'+y')
(c) (BC' + A'D)(AB'+CD')

4. Reduce the following Boolean expressions to the indicated number of literals:
(a) A'B' + ABC + AC'   to three literals
(b) A'B(D' + C'D) + B(A+A'CD)   to one literal

5. Find the complement of the following expression:
(a) xy' + x'y

6. List the truth table of the function:
(a) F = xy + xy' + y'z

7. Simplify the following Boolean functions T1 and T2 to a minimum number of literals

A	B	C	T1	T2
0	0	0	1	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	0	1
1	0	1	0	1
1	1	0	0	1
1	1	1	0	1

8. Obtain the truth table of the following functions and express each function in sum-of-minterms and product-of-maxterms form:
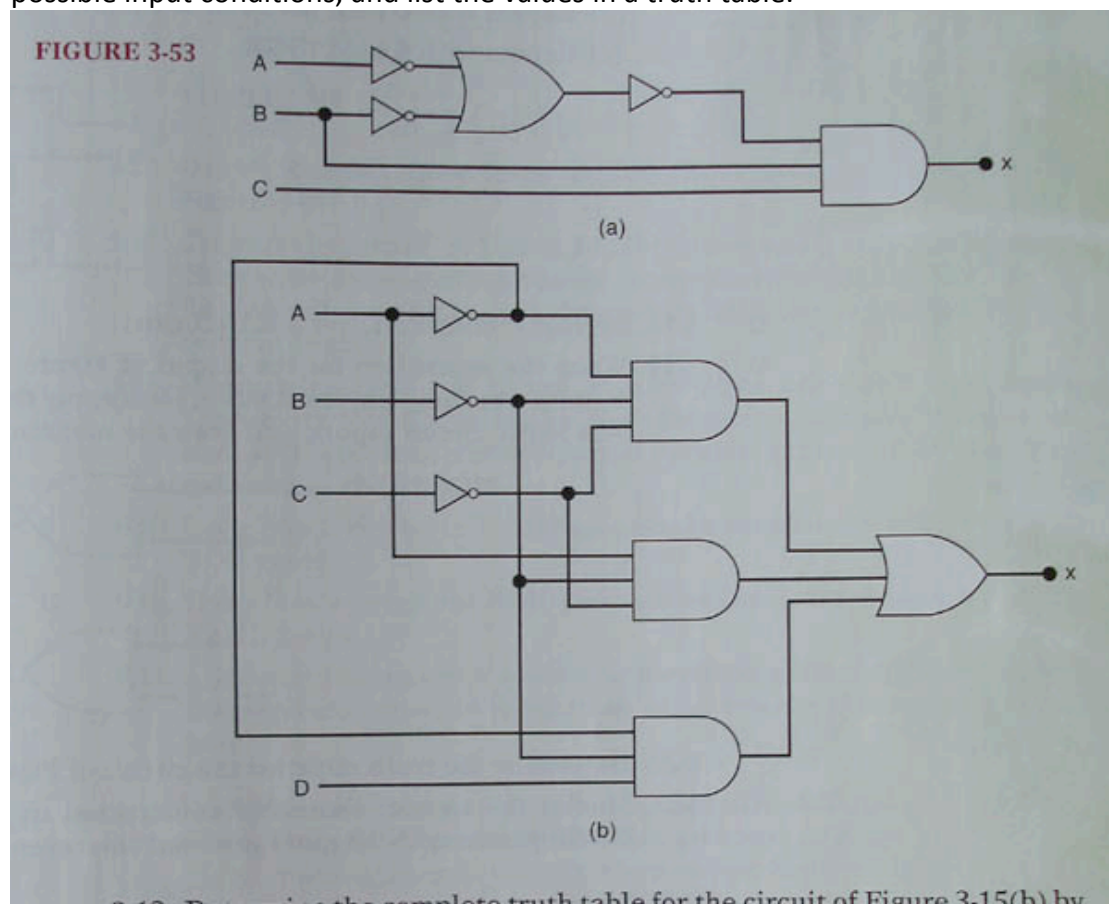(a) (xy + z)(y+xz)

9. Convert the following into sum-of-products and product-of-sums forms:

a): $(D + B'A + A'Y)(B + EF)$

b): $(D' + B'A)(B + A'D')$

c): $(B' + A')D'(D' + B) + D$

10. Write the Boolean expression for output x in figures below. Determine the value of x for all possible input conditions, and list the values in a truth table.

FIGURE 3-53

(a)

(b)

2.12 Determine the complete truth table for the circuit of Figure 3-15(b) by

11. A jet aircraft employs a system for monitoring the rpm, pressure and temperature values of its engines using sensors that operate as follows:

   RPM sensor output = 0 only when speed < 4800 rpm

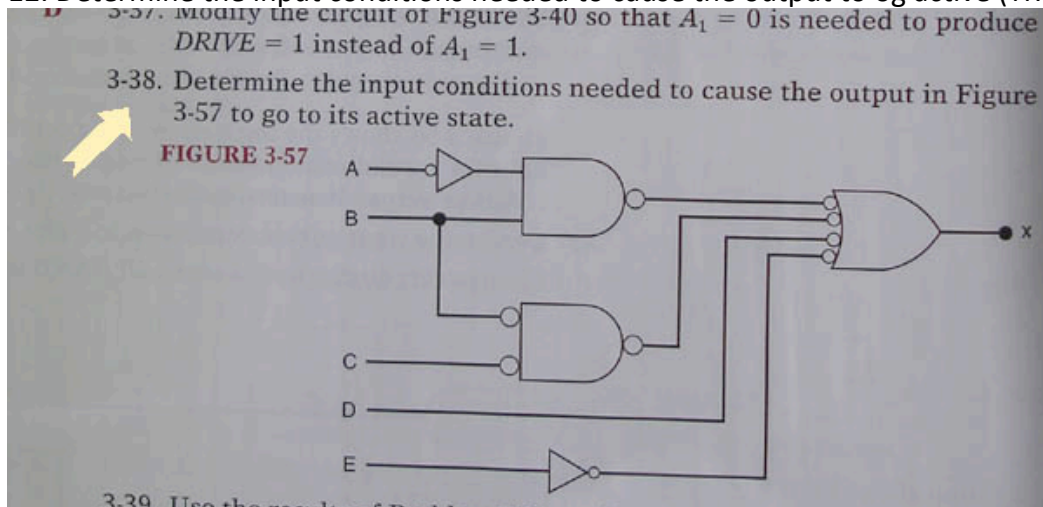   P sensor output = 0 only when pressure < 220 psi

    T sensor output = 0 only when temperature < 200 F

The Figure below shows the logical circuit that controls a cockpit warning light for certain combinations of engine conditions. Assume that a HIGH at output W activates the warning light.

FIGURE 3-56
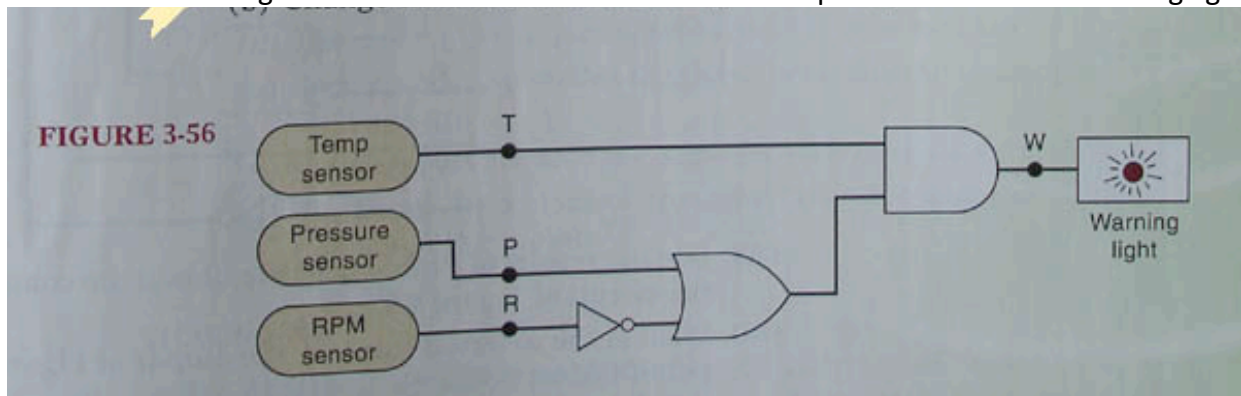
Determine what engine conditions will give a warning to the pilot.

12. Determine the input conditions needed to cause the output to og active (TRUE).

3-37. Modify the circuit of Figure 3-40 so that $A_1 = 0$ is needed to produce $DRIVE = 1$ instead of $A_1 = 1$.

3-38. Determine the input conditions needed to cause the output in Figure 3-57 to go to its active state.

FIGURE 3-57

3-39. Use the results of Probl.

13. (FUN) Simplify the following expression

  $F = (\,(xy)'(xy')' + z'z\,)'$