Practical 3

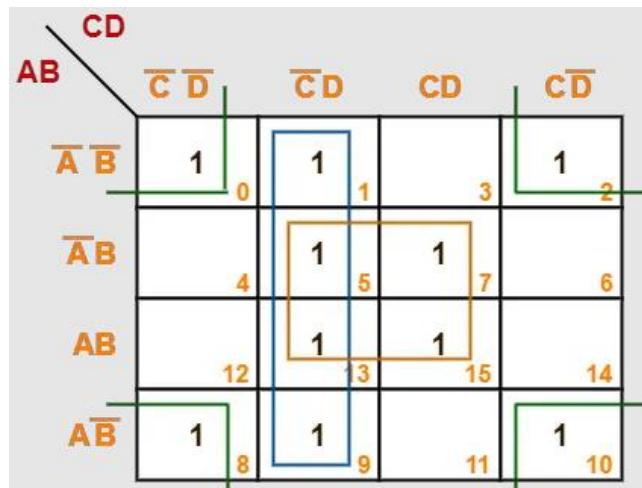**Aim: Implement combinational circuits.**

1. Minimize the following Boolean function using k-map-

   F (A, B, C, D) = Σm (0, 1, 2, 5, 7, 8, 9, 10, 13, 15)
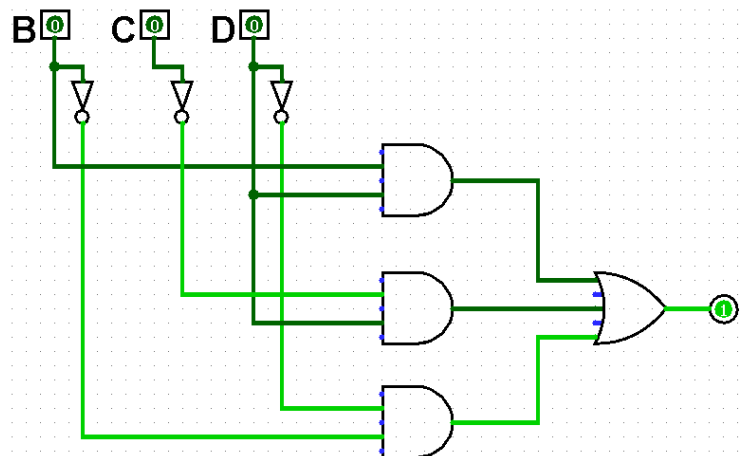
   Solution-

   - Since the given Boolean expression has 4 variables, so we draw a 4 x 4 K Map.

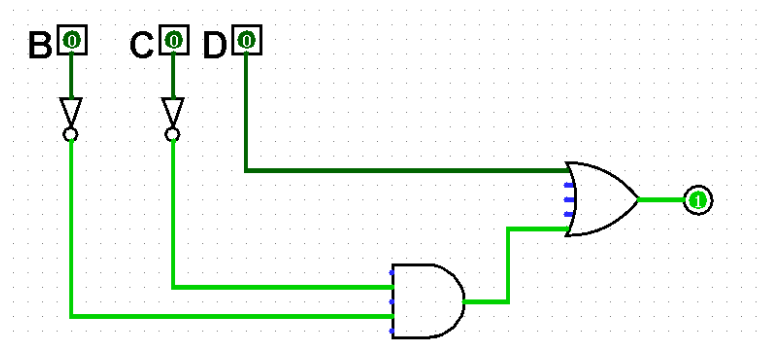Thus, minimized Boolean expression is -
   F (A, B, C, D) = BD + C'D + B'D'

2. Minimize the following Boolean function using k-map-

   F (A, B, C, D) = Σm (0, 1, 3, 5, 7, 8, 9, 11, 13, 15)

   Solution-

Thus, minimized Boolean expression is-

F (A, B, C, D) = B'C' + D

3. Minimize the following Boolean function using k-map-

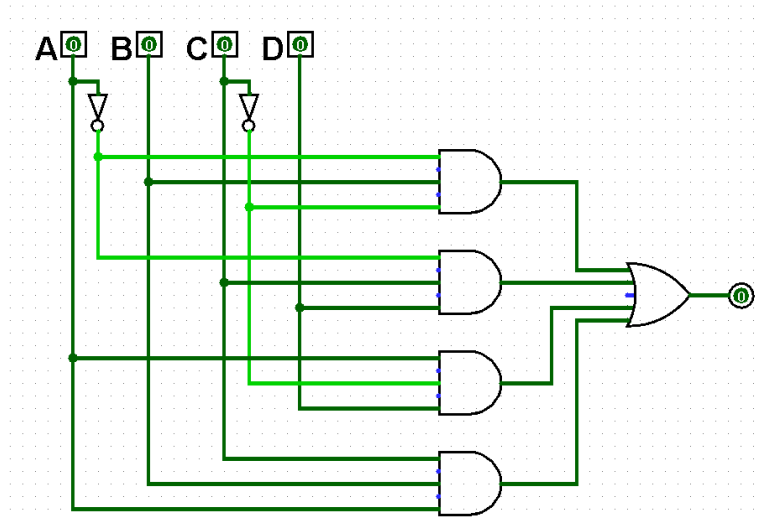F (A, B, C, D) = Σm (3, 4, 5, 7, 9, 13, 14, 15)

Solution-

Thus, minimized Boolean expression is-

F (A, B, C, D) = A'BC' + A'CD + AC'D + ABC

A 0   B 0   C 0   D 0

4. Minimize the following Boolean function using k-map-

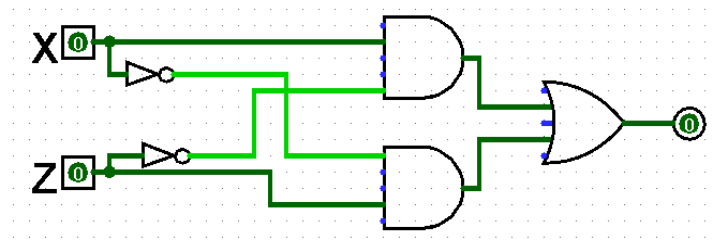F (W, X, Y, Z) = Σm (1, 3, 4, 6, 9, 11, 12, 14)

Solution-

Thus, minimized Boolean expression is-
   F (W, X, Y, Z) = XZ' + X'Z

   F (W, X, Y, Z) = X ⊕ Z

X ▣

Z ▣

OR

X ▣

Z ▣