

## Assignment 3- Gate-level Minimization

1. Use a karnaugh map to minimize the following expression:

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

- (i) In Product of Sum expression.
- (ii) In Sum of product expression
- (iii) Draw the S.O.P and P.O.S using the simulator

2. Use a karnaugh map to minimize the following expression in:

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

- (i) In Product of Sum expression.
- (ii) In Sum of product expression
- (iii) Draw the S.O.P and P.O.S using the simulator

3. Simplify using K-Map the following function :

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

- (i) Design the simplified function using NOR gates only.
- (ii) Design the simplified function using NAND gates only.