Digital Design

COE 211

Sheet - 07

1. Identify each of the following expressions as **SOP**, **standard SOP**, **POS**, or **standard POS**:
   a) $AB + \bar{A}BD + \bar{A}C\bar{D}$
   b) $\bar{A}BC + AB\bar{C}$
   c) $(A + \bar{B} + C)(A + B + \bar{C})$
   d) $(A + \bar{C})(A + B)$

2. Convert each SOP expression in Question 1 to standard form

3. Convert each POS expression in Question 1 to standard form

4. Convert the following SOP expression to an equivalent POS expression:
   $\bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}BC + A\bar{B}C + ABC$

5. Create a truth table for the standard SOP expression $\bar{A}B\bar{C} + A\bar{B}C$.

6. Develop a truth table for the following standard POS expression:
$$(A + \bar{B} + C)(A + B + \bar{C})(\bar{A} + \bar{B} + \bar{C})$$

7. From the truth table below, determine the standard SOP expression and the equivalent standard POS expression.

Inputs			Output
A	*B*	*C*	*X*
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

8. Construct a truth table for each of the following Boolean expressions:
$$A\bar{B} + B\bar{C} + C\bar{A}$$

9. Develop a truth table for each of the following standard SOP expressions
$ABC + \bar{A}\bar{B}C + AB\bar{C}$

10. Develop a truth table for each of the standard POS expressions:
$(\bar{A} + \bar{B} + \bar{C})(A + B + C)(A + B + \bar{C})$

11. For the truth table below, derive a standard SOP and a standard POS expression.

A B C	*X*
0 0 0	0
0 0 1	0
0 1 0	0
0 1 1	0
1 0 0	0
1 0 1	1
1 1 0	1
1 1 1	1