Assignment #3

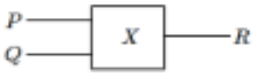
SIMPLIFY THE BOOLEAN FUNCTION USING BOOLEAN ALGEBRA

1. AB + A(B + C) + B(B + C)
2. AB’ + A(B + C)’ + B(B + C)’.
3. [AB’(C + BD) + A’B’]C
4. A’BC + AB’C’ + A’B’C’ + AB’C + ABC
5. ((A + B)’ + C)’
6. (a+b’+c+d’)+(b+c’)
7. x’y’z +yz+ xz
8. (A + B’ + C’)(A + B’ + C)(A + B + C’)
9. XY + X(Y’+Z)’ + Y(Y+Z)
10. (XY(Y’Z + XZ))’

11. Express the Boolean function F = A + B’C in a sum of minterms (SOP).
12. Express F = xy + x’z in a product of maxterms form.
13. How many different Boolean functions of n variables are there?
14. Find out the dual of the given Boolean function AB’C+BC’+AC’.
15. How many number of self dual functions of n variables?

16. Simplify the following Boolean expression using Karnaugh map: F(x,y,z)= Σ(3,4,6,7)
17. Simplify the following Boolean expression using Karnaugh map: F(x,y,z)= Σ(0,1,2,4,5,6)
18. Simplify the following Boolean expression using Karnaugh map:
    F(w,x,y,z)= Σ(0,1,2,4,5,6,8,9,12,13,14)
19. Simplify the following Boolean expression using Karnaugh map:
    F(w,x,y,z)= Σ(0,2,3,5,7,8,9,10,11,13,15)
20. Simplify the following Boolean function in sum of minterm:
    F(A, B, C, D) = Σ(0, 6, 8, 13, 14) d (A, B, C, D) = Σ(2, 4, 10)
    where, d stands for don't care condition
21. Simplify the following Boolean expression using Karnaugh map:
    F(w,x,y,z)= Σ(1,3,7,11,15)+ x(0,2,5,8)
22. What is the logic equation of an EX-NOR gate having A and B as its input?

23. Logic gates X and Y have the truth tables shown below:



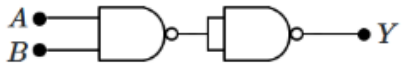
X		
P	Q	R
0	0	0
1	0	0
0	1	0
1	1	1

Y	
P	R
0	1
1	0

When the output of X is connected to the input of Y, the resulting combination is equivalent to a single:

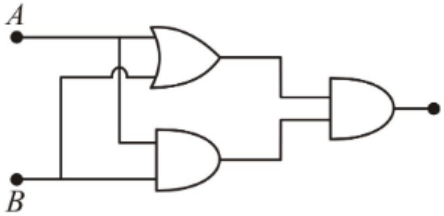
1. NOT gate
2. OR gate
3. NAND gate
4. AND gate

24. Following diagram performs the logic function of:



1. AND gate
2. NAND gate
3. OR gate
4. XOR gate

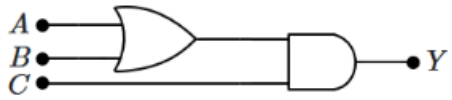
25. The combination of gates shown in the diagram is equivalent to:



1. OR
2. AND
3. NAND
4. NOT

26.

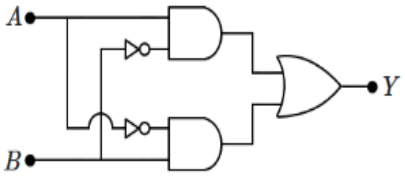
To get output $Y = 1$ for the following circuit, the correct choice for the input is:



1.	$A = 1,\ B = 0,\ C = 0$
2.	$A = 1,\ B = 1,\ C = 0$
3.	$A = 1,\ B = 0,\ C = 1$
4.	$A = 0,\ B = 1,\ C = 0$

27.

For the logic circuit given below, the output Y for $A = 0, B = 0$ and $A = 1, B = 1$ are:



1. 0 and 1
2. 0 and 0
3. 1 and 0
4. 1 and 1

28.

The output of the OR gate is 1:

1.	only if both inputs are zero.
2.	if either or both inputs are 1.
3.	only if both inputs are 1.
4.	if any of the inputs is zero.