



INDIAN SCHOOL AL WADI AL KABIR

Class: XI	Department: Computer Science	Date of submission: 29/05/2020
Worksheet -3	Topic: Boolean Algebra	Note: for practice

Q.I

Prove the Boolean Laws shown below using Truth Table.

S.No.	Theorems	Laws
1	Properties 0	$0+X=X$ $0.X=0$
2	Properties 1	$1+X=1$ $1.X=X$
3	Idempotence Law	$X+X=X$ $X.X=X$
4	Involution Law	$(X')' = X$
5	Complementarity Law	$X+X' = 1$ $X.X' = 0$
6	Commutative Law	$X + Y = Y+X$ $X.Y = Y.X$
7	Associative Law	$X+(Y+Z)=(X+Y)+Z$ $X.(Y.Z)=(X.Y).Z$
8	Distributive Law	$X.(Y+Z)=X.Y+X.Z$ $X+(Y.Z)=(X+Y)(X+Z)$
9	Absorption Law	$X+XY=X$ $X.(X+Y)=X$
10	Other Law (3 rd Distributive Law)	$X + X'.Y = X+Y$

Q.II

1. Write a short note on Boolean Algebra.
2. State the principle of duality with a suitable example

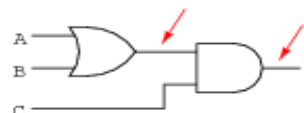
Q.III

1. State and prove De Morgan's Theorems.
 - i. Use truth table
 - ii. Use algebraic method
2. State and prove Absorption law .Use algebraic method to prove it.
3. State and prove idempotence law. Use algebraic method to prove it.

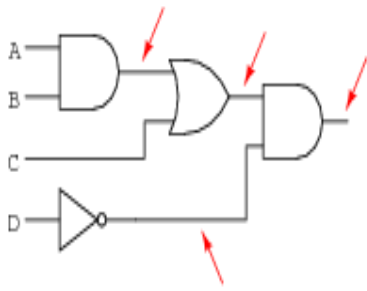
Q.IV

Convert the following logic gate circuit into a Boolean expression.(Write the Boolean expression for the given circuits)

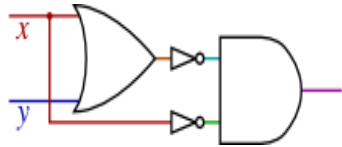
1.



2.



3.



Q.V

1. Draw Logic circuit for $y = A.C + B.C' + A'.B.C$
2. Draw Boolean Logical Circuit from the given Boolean expression:
 $Q = A.B + B.C.(B+C)$
3. Draw Logic circuit for $y = A.C + B.C' + A'.B.C$
4. Draw a circuit diagram corresponding to the following Boolean Expression:
 - a) $y = A+C .B+C' . A'+B+C$
 - b) $F = A'.B.C.(A+D)'$
 - c) $F = A.B'+C'.D$
 - d) $F = (U.V')+(U'.W')$
 - e) $F = A.B + A.C' + B'.A'.C$
 - f) $F = (X+Y).(X'+Z).(Y+Z)$

Note : Other Law (3rd Distributive Law) $X + X'.Y = X + Y$