

Name: Solution

Roll no: _____

Time: 15 minutes

Total Marks: 10

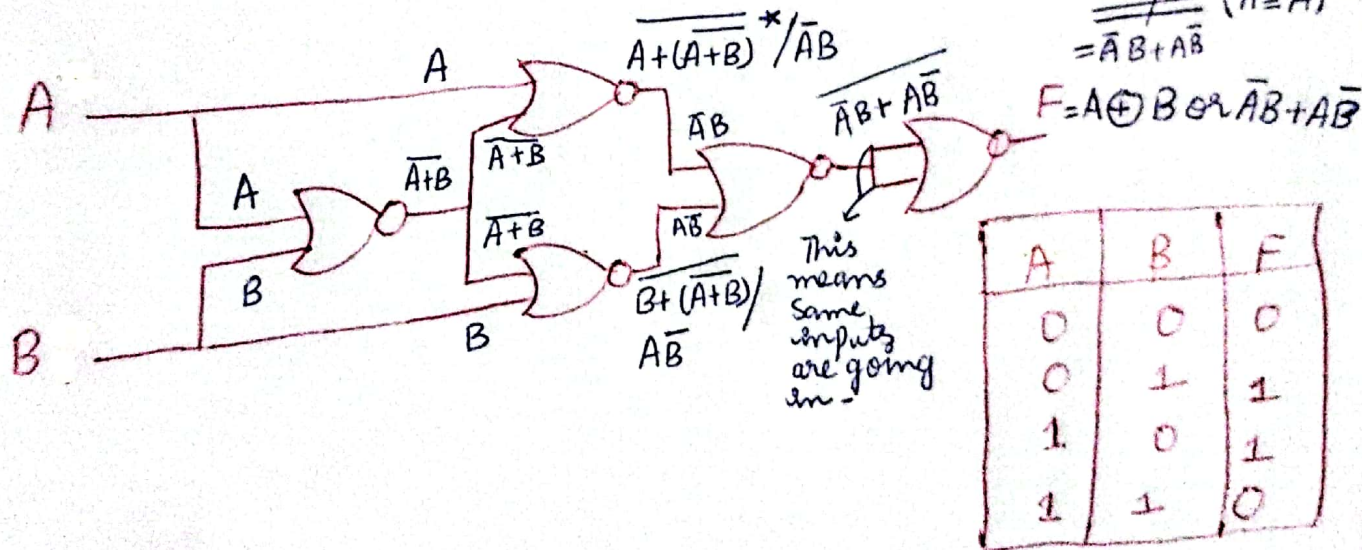
Boolean Expression	Category	Boolean Expression	Category
1. $A+0=A$ 2. $A+1=1$ 3. $A0=0$ 4. $A1=A$	Existence of 0 and 1	1. $A+A=A$ 2. $AA=A$	Idempotence
$A+\bar{A}=1$ $A\bar{A}=0$	Existence of complement (CM)	1. $A \cdot (A+B) = A$ 2. $A + (A \cdot B) = A$	Absorption Law
$A+B=B+A$ $AB=BA$	Commutative Laws	$\bar{\bar{A}} = A$	Involution
$A(B+C) = AB+AC$ $A+B.C = (A+B)(A+C)$	Distributive Laws	$A+(B+C) = (A+B)+C$ $A.(B.C) = (A.B).C$	Associative Law
		$\overline{A+B} = \bar{A}.\bar{B}$ $\overline{A.B} = \bar{A}+\bar{B}$	DE Morgan's Law (DM)

(Apply DM)
 $*A+(A+B) DM$
 $= A.(A+B)$
 $= \bar{A}(A+B)$
 $= \bar{A}\bar{A} + \bar{A}B$ (Apply DM)
 $= \bar{A}B$ (cm)

* Do Same for
 $B+(A+B)$
 $= AB$

Double complements cancel each other

1. Implement XOR Gate using NOR gates and show its Truth Table.



2. Implement OR Gate using NAND gates and show its derivation.

