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Dept : B.Sc in CSE

Course title : Digital Logic Design

Course code : CSE 213

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Ans to the que NO: 01

(a) $A + A'B = ?$

In absorption law,

$$A + A'B = A$$

So, $A + A'B$ is equal to A (Ans)

(b) $A'B' + AB = ?$

Use distributive law,

$$A'B' + AB = (A' + A)B'$$

Now, $(A' + A)$ is always equal to 1

$$\text{So, } A'B' + AB = (1)B'$$
$$= B'$$

(Ans)

(c) $(A+B)(A+C) = ?$

Use distribution law,

$$(A+B)(A+C) = A(A+C) + B(A+C)$$
$$= A(A+C)$$
$$= AA + AC$$
$$= A + A \times C$$

$$B(A+C) = BA + BC = AB + BC$$

So, Expr is

$$(A+B)(A+C) = (A+AC) + (AB+B^*C).$$

Apply {(A+A) = A} and (A+A*C) = A) in Boolean Algebra

$$(A+AC) + (AB+BC) = A + (AB + B^*C)$$

So, (A+B)(A+C) simplify to

$$A + (AB+BC)$$

(d) $(A+B+C+B)' = ?$

Apply De morgan's theorem.

$$(A+B+C+D)^* = A^* B^* C^* D^*$$

So, $(A+B+C+D)'$ is equal to $A'B', C', D'$

(e) $(ABCD)' = ?$

Now, $(ABCD) = A' + B' + C' + D'$

Ans to the Qus NO: 02 (b)

Ans: $A'B'C' + A'BC + AB'C + ABC$ step 1 $A'B$ is common to terms 1 and 2 so

$A'B(C'+C) = A'B$ as $C'+C = 1$

we now have

$A'B + AB'C + ABC$

step 2 note that AC is common to terms to 2 and 3 so,

$A'B + AC(B'+B)$ recall that $B'+B = 1$

Answer then becomes $A'B + AC$.

Ans to the Qus NO: 02 (a)

Ans: The given expression seems to have a closing parenthesis mismatch. Assuming the expression is $(A'B + A'B') + (A'B' + AB)$, let's simplify it using Boolean algebra laws:

1. $A'B + A'B' = A'B$ (Absorption Law)
2. $A'B' + AB = B + A'B'$ (Absorption Law)

Now, the simplified expression becomes:

$$F = A'B + B + A'B'$$

If you meant a different expression or if there was a mistake in the input, please provide the correct expression for further assistance.

Ans to the Qus No: 03

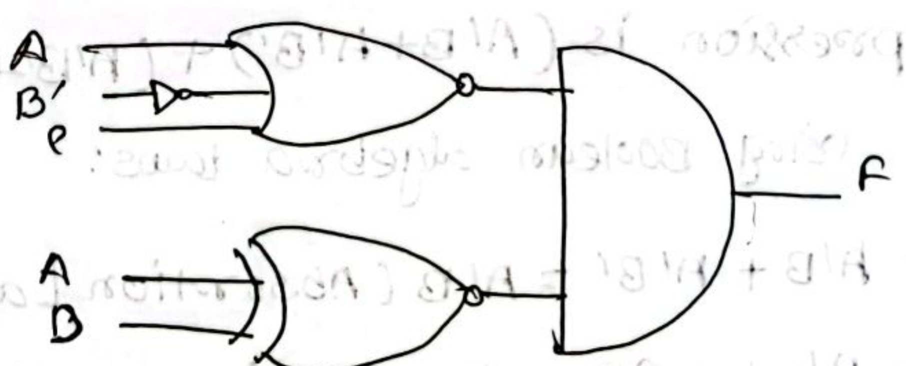
(a) $\left\{\overline{\overline{(x+y)}+e}\right\} + \left\{\overline{(x+y)}e + xy\right\}$

Ans:

⇒ The function for the given circuit.

(b) $F = (A+B'+e)' \times NOR\ (A+B)$

Ans:



Ans to the Qus No: 04

Ans: Truth Table for the function:

$$\left\{\overline{(\bar{x}+\bar{y})+c}\right\}+\left\{\overline{(\bar{x}+\bar{y})}c+xy\right\}. \quad [\text{from } 3a]$$

x	y	c	$\bar{x}$	$\bar{y}$	$\bar{c}$	$\bar{x}+\bar{y}$	$\overline{\bar{x}+\bar{y}+c}$	$\overline{(\bar{x}+\bar{y})}\cdot c$	xy	$\overline{(\bar{x}+\bar{y})}c+xy$	$\{\overline{(\bar{x}+\bar{y})+c}\}+\{\overline{(\bar{x}+\bar{y})}c+xy\}$
0	0	0	1	1	1	1	0	0	0	0	1
0	0	1	1	1	0	1	1	1	0	1	1
0	1	0	1	0	1	1	0	0	0	0	1
0	1	1	1	0	0	1	1	1	0	1	1
1	0	0	0	1	1	1	0	0	0	0	1
1	0	1	0	1	0	1	1	1	0	1	1
1	1	0	0	0	1	0	0	0	1	1	1
1	1	1	0	0	0	0	0	0	1	1	1