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Department of Computer Science & Engineering  
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Final Examination

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Course Code: CSE-213

Course Title: Digital Logic Design

(1) :

Answer to the question no: 1(a)

1. (a):  $A + A'B = ?$

In absorption law,

$$A + A'B = A$$

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

1. (b):  $A'B' + AB = ?$

Use distributive law,

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

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

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

(Ans):

1. (c):  $(A+B)(A+C) = ?$

Use distribution law,

$$\begin{aligned} (A+B)(A+C) &= A(A+C) + B(A+C) \\ &= A(A+C) \\ &= AA + AC \\ &= A + AC \end{aligned}$$

P.T.O.

(2):

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

So, Expans is

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

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

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

So,  $(A+B)(A+C)$  Simplify to

$$A + (AB+BC)$$

1. (d):  $(A+B+C+D)' = ?$

Apply De Morgan's Theorem,

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

So,  $(A+B+C+D)^*$  ..... is equal to  $A^* B^* C^* D^*$

1. (e):  $(ABCD)' = ?$

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

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.

2)

Answer to the question no: 2 (a)

2. (a) Ans:  $(A'B + A'B) + (A'B' + AB)$  Step 1,  $A'B$  is common  
= to terms 1 and 2 so,

$$A'B (C' + C) = A'B \text{ as } C' + C = 1$$

We know have,

$$A'B + AB' + ABC$$

Step-2, not that  $AC$  common to terms to 2 and 3, so

$$A'B + AC(B' + B) \text{ recall that } B' + B = 1$$

Answer then becomes  $A'B + AC$ .

Answer to the question no: 2 (b)

2. (b) Ans:  $A'B'C + A'BC' + AB'C' + ABC$

$$= A'BC + AB'C + A'B'C' + ABC' + ABC$$

$$= A'BC + ABC + A'B'C' + AB'C' + AB'C' + ABC$$

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

$$= BC + B'C + AB'$$

$$(AB'C' = AB'C' + AB'C')$$

Hence, Option (D)  $AB' + BC + B'C$  is the correct choice.

(4)

Answer to the question no: 3 (a)

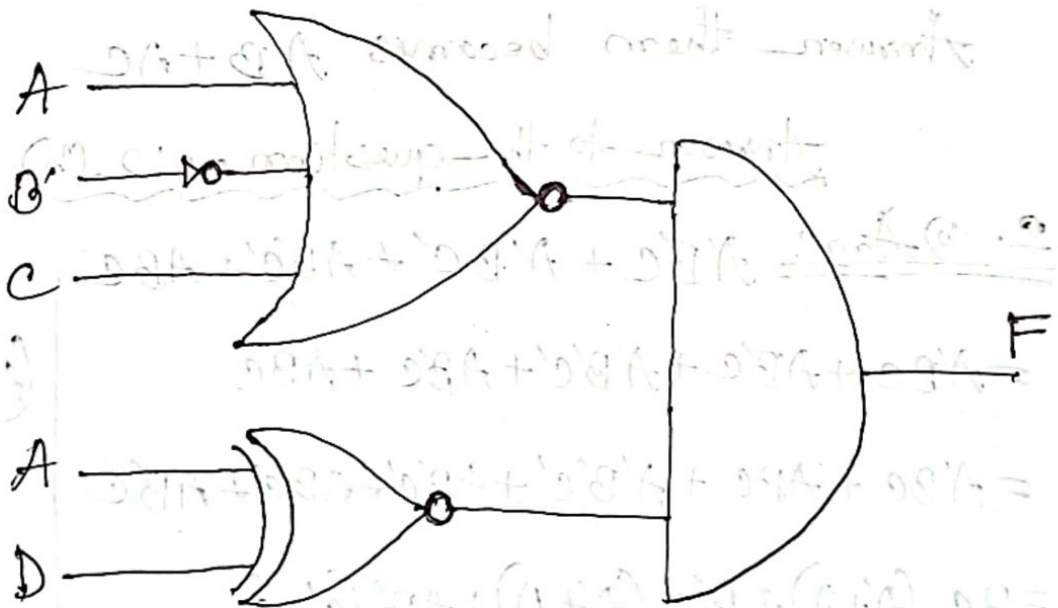
3. (a) Ans:  $\{ \overline{(x+y)+c} \} + \{ \overline{(x+y)c+xy} \}$

Ans

⇒ The function for the given circuit,

Answer to the question no: 3 (b)

3. (b) Ans:  $F = (A+B+C)' \text{ XNOR } (A+D)$



Ans:

5

Answer to the question no: (4)

4. Ans: Truth table for the function:  $\{(\overline{x+y})+c\} + \{(\overline{x+y})c+xy\}$   
(from -3 (a))

X	Y	C	$\overline{x}$	$\overline{y}$	$\overline{c}$	$\overline{x+y}$	$\overline{x+y}+c$	$(\overline{x+y})+c$	XY	$(\overline{x+y})c+xy$	$\{(\overline{x+y})+c\} + \{(\overline{x+y})c+xy\}$
0	0	0	1	1	1	1	1	0	0	0	1
0	0	1	1	1	0	1	1	1	0	1	1
0	1	0	1	0	1	1	1	0	0	0	1
0	1	1	1	0	0	1	1	1	0	1	1
1	0	0	0	1	1	1	1	0	0	0	1
1	0	1	0	1	0	1	1	1	0	1	1
1	1	0	0	0	1	0	1	0	1	1	1
1	1	1	0	0	0	0	0	0	1	1	1