CSE 260

Assignment 02

Name: Shihab Muhtasim

ID: 2130610

Sec: 1 (NRT)

Ans to the qr no 1

a

$$x'yz' + x'yz + xyz + x'yz'$$

$$= x'yz' + x'yz' + x'yz + xyz$$

$$= x'yz' + x'yz + xyz \qquad [x + x = x]$$

$$= x'y(z' + z) + xyz \qquad [x + x' = 1]$$

$$= x'y + xyz$$

$$= y(x' + xz) \qquad [x + yz = (x+y)(x+z)]$$

$$= y(x' + x)(x' + z)$$

$$= y(x' + z)$$

$$= x'y + yz$$

b

$$(x'+y')(x+y)$$

$$= xx' + x'y + xy' + yy'$$

$$= 0 + x'y + xy' + 0 \quad [x.x' = 0]$$

$$= x'y + xy'$$

$$= x \oplus y \quad [AB' + A'B = A \oplus B]$$

c

$$(a'+b)'\,(a+b')'$$

$$= (a''.\ b')\,(a'.\ b'') \quad [(x+y)' = x'.y']$$

$$= (a.b')\,(a'.b) \quad [(x')' = x]$$

$$= (a.a')(b.b') \quad [x.x' = 0]$$

$$= 0$$

Ans to the qr no 2

(a) $x'y' + xy'$

$= (x'+y') \cdot (x+y')$ [Dual of the function]

$= (x+y) \cdot (x'+y)$ [compliment literals]

$= x.x' + xy + x'y + y.y$

$= 0 + y(x+x') + y$ [$x.x = x$, $x.x' = 0$]

$= y + y$ [$x + x' = 1$]

$= y$ (Ans)

(b) $(x' + y + z')(x'+y')(x+z')$

$= (x'.y.z') + (x'.y') + (x.z')$ [Dual]

$= (x.y'.z) + (x.y) + (x'.z)$ [compliment literals]

$= x(y + y'z) + x'z$

$= x(y+y')(y+z) + x'z$ [$x + yz = (x+y)(x+z)$]

$= x(y+z) + x'z$ [$x + x' = 1$]

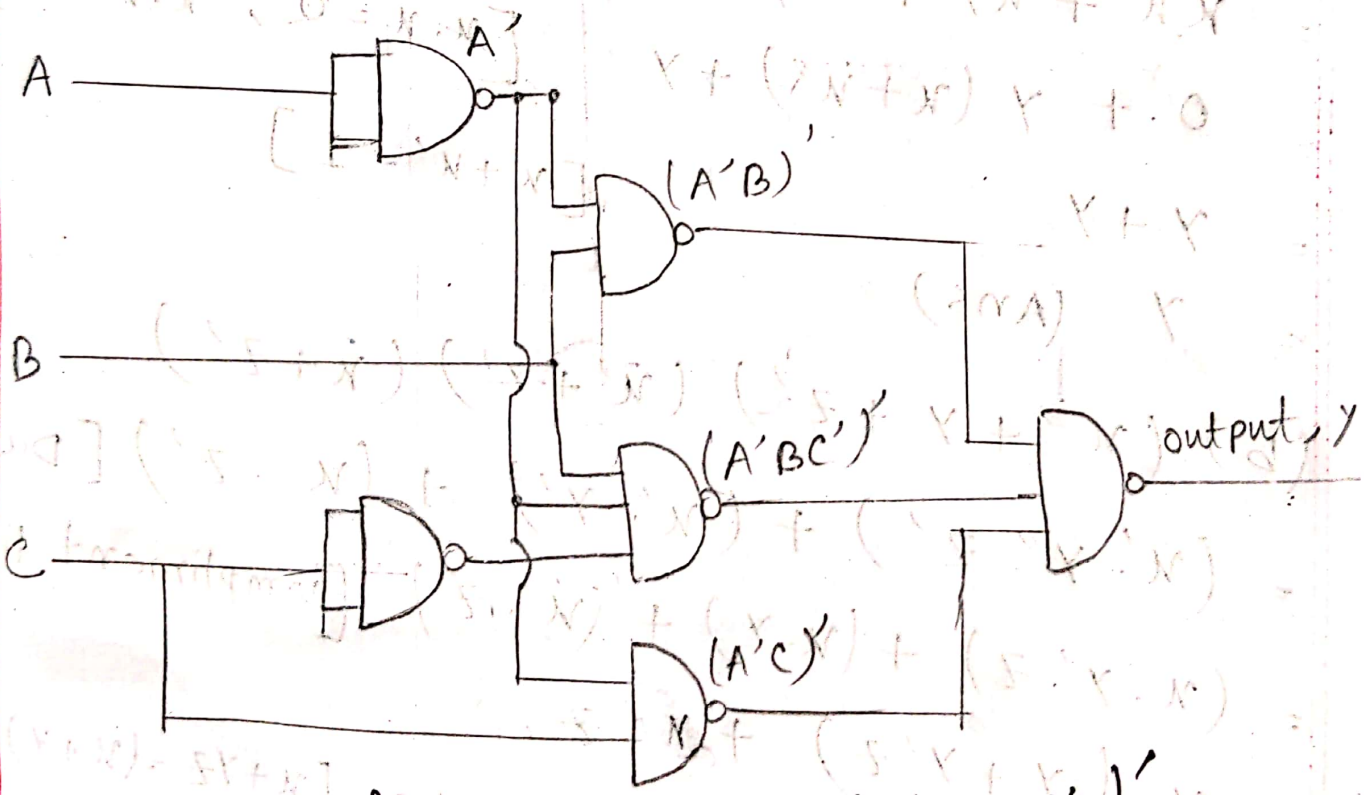
$= xy + xz + x'z$

$= xy + z(x + x')$

$= xy + z$ (Ans)

Ans to the qn no 3

(a) $F(A, B, C) = A'B + A'BC' + A'C$

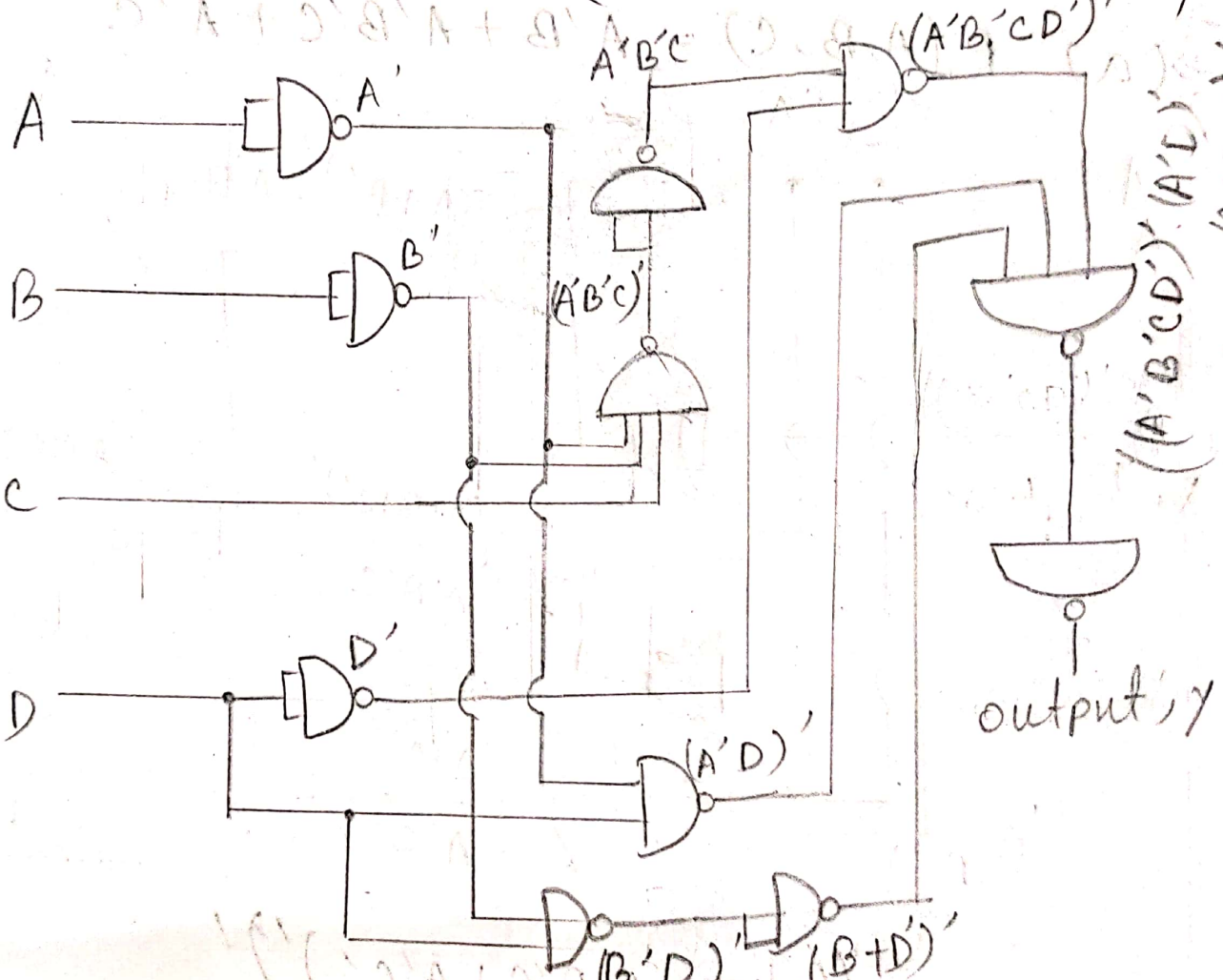


Here, $Y = \{(A'B)' . (A'BC')' . (A'C)'\}'$

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

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

(b) $F(A,B,C,D) = \left(A'B'CD' + A'D + (B+D')\right)'$



$= B'' + D'$

$= (B + D')$

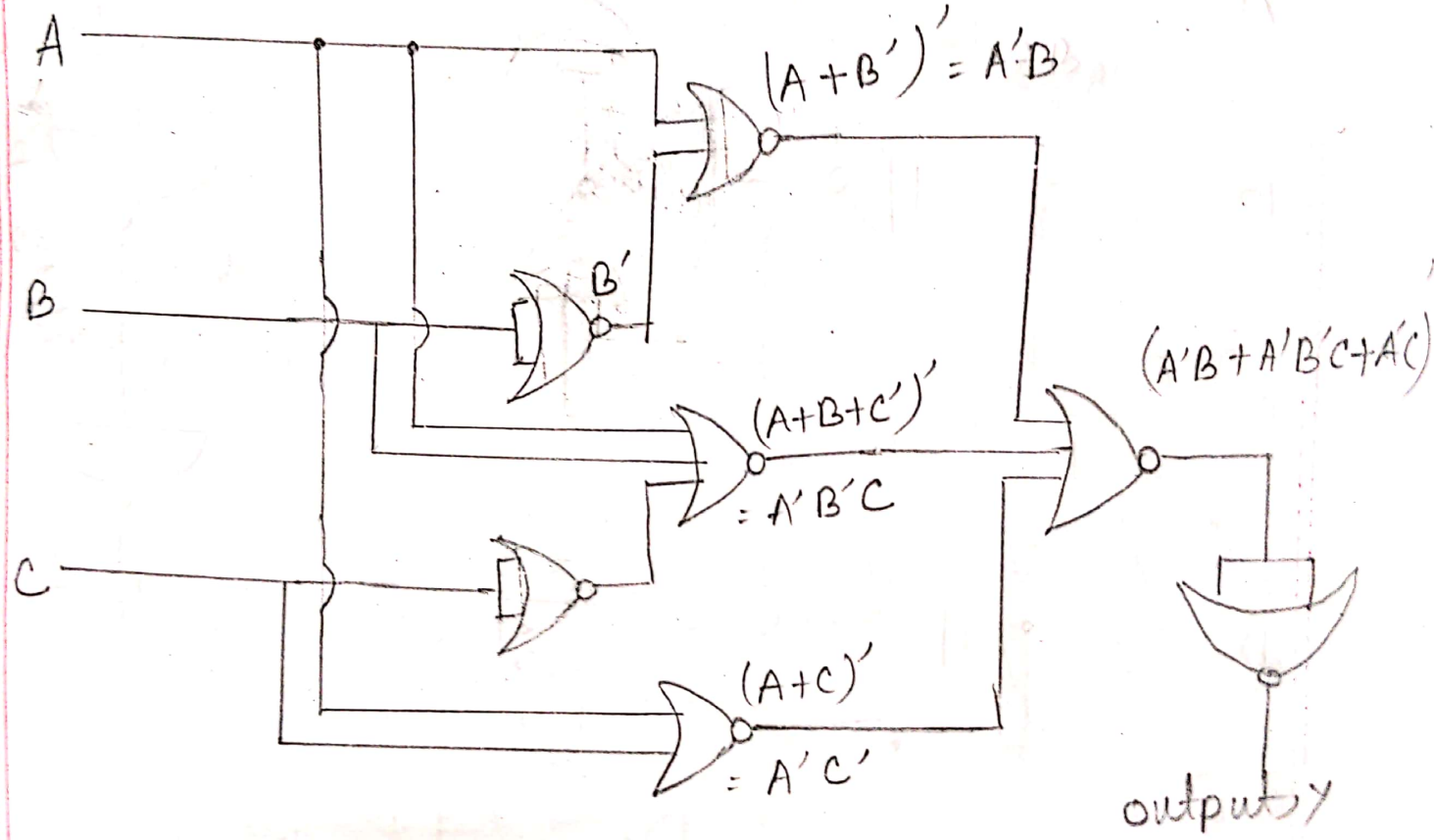
Here, $Y = \left((A'B'CD')'.(A'D)'.(B+D')'\right)'$

$= \left((A'B'CD')'' + (A'D)'' + (B+D')''\right)'$

$= \left(A'B'CD' + A'D + (B+D')\right)'$

Ans to the qno 4

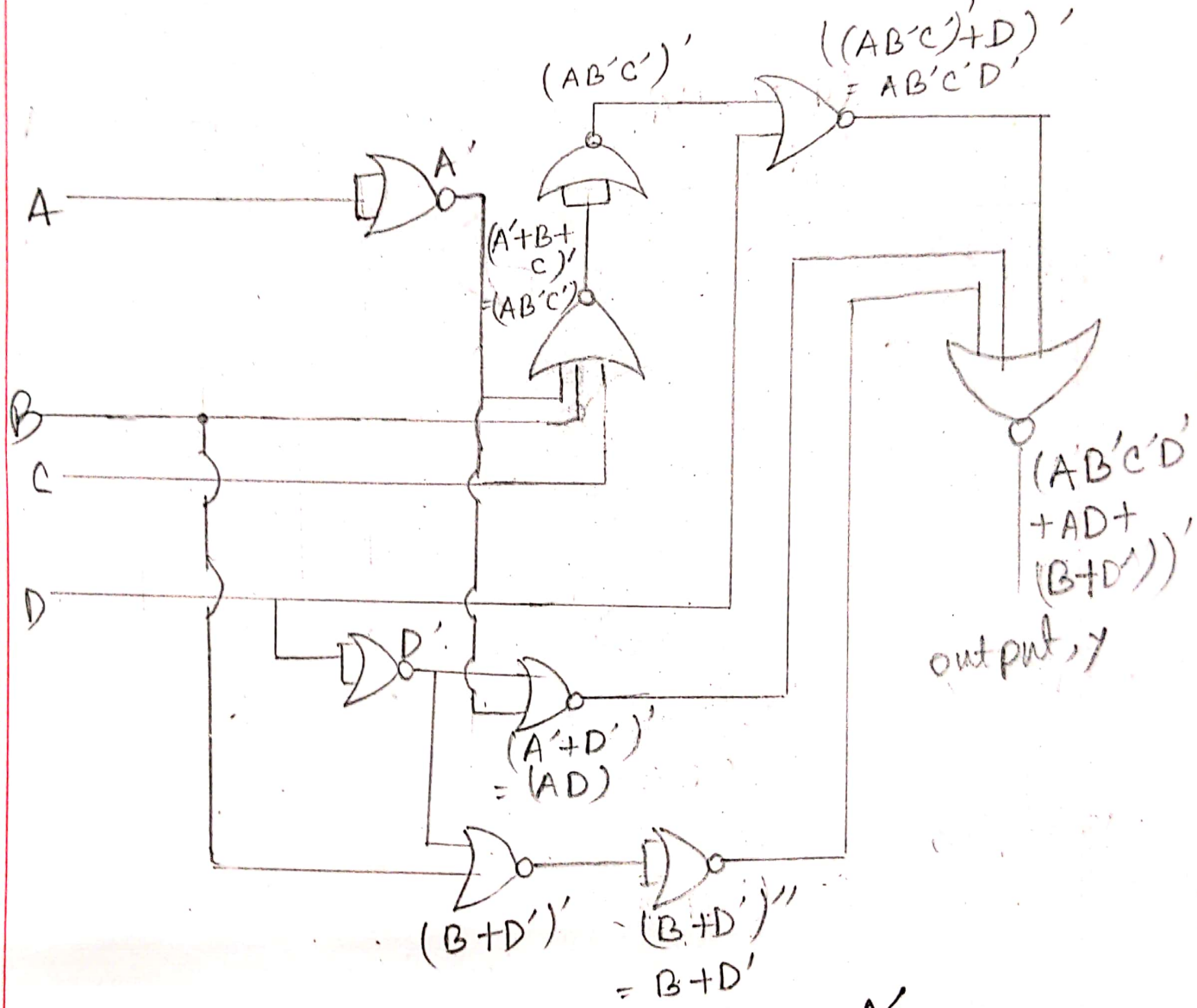
(a) $F(A,B,C) = A'B + A'B'C + A'C'$



Here, $Y = ((A'B + A'B'C + A'C')')'$

$= A'B + A'B'C + A'C'$

(b) $F(A,B,C,D) = (AB'C'D' + AD + (B+D'))'$



Here, $Y = ((AB'C'D') + (AD) + (B+D'))'$

$= (AB'C'D' + AD + (B+D'))'$