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Subject : DLD

Degree : BS.SE

Assignment # 3 !!

Q:1

Answer:

$A + B + C + D = 0$

when $A = 0, B = 0, C = 0, D = 0$

Ans

Q:2

Answer

$A + B + C + D = 1$

if Either $A = 1$ or $B = 1$ or $C = 1$ or $D = 1$

Ans

Q:3

Answer

$ABC = 0$

if Either $A = 0$ or $B = 0$ or $C = 0$

Ans

Date

Q: 4

Answer

a) $0+0+0+1=1$ Ans

b) $1 \cdot 0 \cdot 1 \cdot 0 = 0$ Ans

c) $1 \cdot 0 + 1 \cdot 0 + 0 \cdot 1 + 0 \cdot 1$

$0+0+0+0=0$ Ans

Q: 5

Answer

a) $\bar{A}\bar{B}C = 1$

only if $A=0, B=0 \Rightarrow \bar{A}=1, \bar{B}=1, C=1$

Ans

b) $\bar{A}+\bar{B}+C=0$

only if $A=1, B=1$

$\Rightarrow \bar{A}=0, \bar{B}=0, C=0$

Ans

Q : 6

Answer

a) $\overline{(ABC)}\ \overline{(EFG)} + \overline{(Hij)}\ \overline{(KLM)}$

Solution :→

$\overline{(ABC)}\ \overline{(EFG)}\ \overline{(Hij)}\ \overline{(KLM)} \Rightarrow \bar{A}+\bar{B}=\overline{AB}$

$\overline{(ABC)}\ \overline{(EFG)}\ \overline{(HIJ)}\ \overline{(KLM)} \Rightarrow \bar{\bar{A}}=A$

$= (A+B+C)(E+F+G)(H+I+J)(K+L+M)$

$\Rightarrow \overline{ABC} = \bar{A}+\bar{B}+\bar{C}$

b) $\overline{(A+B)}\ \overline{(C+D)}\ \overline{(E+F)}\ \overline{(G+H)}$ Ans

Solution : →

$\overline{(A+B)}\ \overline{(C+D)}\ \overline{(E+F)}\ \overline{(G+H)} \Rightarrow \bar{\bar{A}}=A$

$(\bar{A}\,\bar{B})(\bar{C}\,\bar{D})(\bar{E}\,\bar{F})(\bar{G}\,\bar{H}) \Rightarrow \overline{A+B}=\overline{AB}$

Answer.

Q: 7

Answer:

(1) = (AB) + (

Answer

(2) = $(\overline{\bar{A}B})$ or $(A + \bar{B})$

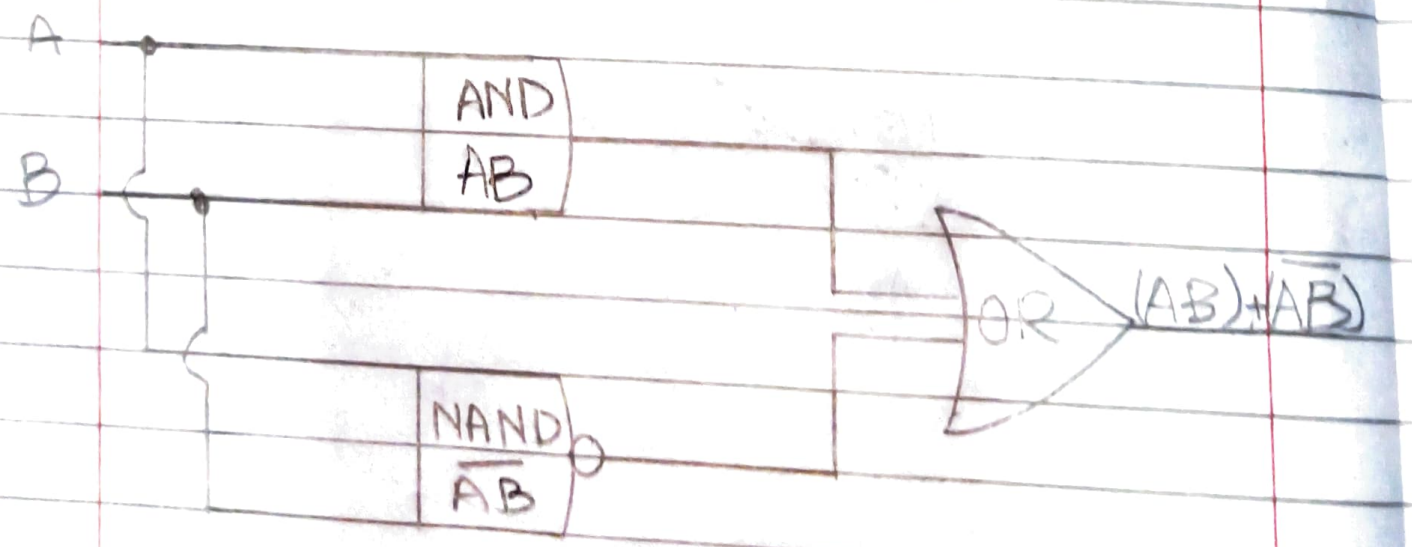
Ans

(3) = (A+B)(

Ans

Q: 8

Answer



Date:

Q : 7

Answer

a)

ASSER

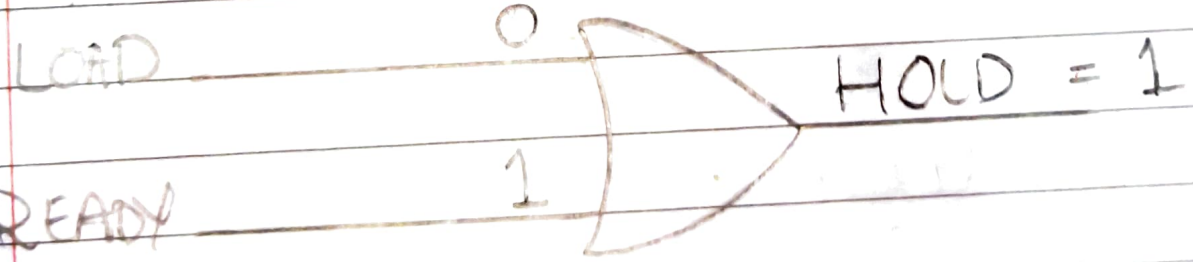
(LOW) 0 → 1

Ready 0 → 1

AND → =1

ENABLE

b)



Q:10

Answer

a) Record = (VCR + CAM1) * RDY

VCR	CAM1	RDY	VCR+CAM1	(VCR+CAM1)*RDY
0	0	0	0	0
0	0	1	0	0
0	1	0	1	0
0	1	1	1	1
1	0	0	1	0
1	0	1	1	1
1	1	0	1	0
1	1	1	1	1

b) Send = (RTS.ENABLE) BUSY

RTS	ENABLE	BUSY	RTS.ENABLE	(RTS.ENABLE)BUSY
0	0	0	0	0
0	0	1	0	0
0	1	0	0	0
0	1	1	0	0
1	0	0	0	0
1	0	1	0	0
1	1	0	1	0
1	1	1	1	1

Q#1:

Answer:

a.

A	B	C	(A+B)	(B+C)	(C+A)	(A+B)(B+C)	(A+B)(B+C)(C+A)
0	0	0	0	0	0	0	0
0	0	1	0	1	1	0	0
0	1	0	1	1	0	1	0
0	1	1	1	1	1	1	1
1	0	0	0	0	1	0	0
1	0	1	0	1	1	1	1
1	1	0	1	1	1	1	1
1	1	1	1	1	1	1	1

b.

A	B	C	$\bar{A}$	$\bar{B}$	$\bar{C}$	$\bar{A}B$	$B\bar{C}$	$\bar{C}A$	$\bar{A}B+B\bar{C}$	$\bar{A}B+B\bar{C}+\bar{C}A$
0	0	0	1	1	1	0	0	0	0	0
0	0	1	1	1	0	0	0	1	0	1
0	1	0	1	0	1	1	0	0	1	1
0	1	1	1	0	0	1	0	0	1	1
1	0	0	0	1	1	0	0	1	0	1
1	0	1	0	1	0	0	1	1	1	1
1	1	0	0	0	1	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0

Q: 19.

Answer:

a. $A(A+B)$.

$AA+AB$ => Distributive law

$A+AB$ => $AA = A$ (Rule 7).

A => $A+AB = A$ (Rule 10).

Ans

b. $A(A+\bar{A}B)$.

$A(A+B)$ => $A+\bar{A}B = A+B$ (Rule 11).

$AA+AB$ => Distributive law.

$A+AB$ => Rule 7 $AA = A$.

A => Rule 10, $A+AB = A$.

Ans

C. $B\bar{C} + \bar{B}\bar{C}$

$\Rightarrow A + \bar{A} = 1$ (Rule 6)

$\Rightarrow AA = A$, (Rule 7)

Ans.

D. Just like past 'b'

E. $A\bar{B}C + \bar{A}BC + A\bar{B}C$

$A\bar{B}C + \bar{A}BC + A\bar{B}C$ = Rearranged.

$(A + \bar{A})(\bar{B}C) + \bar{A}BC$ = Refactor $\bar{B}C$ (distributive)

$1(\bar{B}C) + \bar{A}BC = A + \bar{A} = 1$ (Rule 6)

$\bar{B}C + \bar{A}BC = A \cdot 1 \cdot A$ (Rule 4)

$(\bar{A} + \bar{B})C$ = Refactor C (distributive)

$\bar{A}C + \bar{B}C$ = ~~Distributive~~ law.

Ans.

$BC + (\bar{B} + C)D + BC$.

$BC + (\bar{B} + C)D = BC + BC = BC$.

$BC + \bar{B}D + CD$ = Distributive laws.

$BC + CD + \bar{B}D$ = Rearranged

$BC + \bar{B}D = C + CD = C$, Rule 10.

Ans

g. $BCD[BC + \bar{D}(CD + BD)]$

$BCD[BC + CD\bar{D} + BD\bar{D}] \Rightarrow$

by Distributive law.

$BCD[BC + (0) + B(0)] \Rightarrow D\bar{D} = 0$ (Rule 8)

$BCD(B\bar{B}) \Rightarrow A(0) = 0$ (Rule 3)

$BCD\ BC$

$BCD \Rightarrow (BC)(B\bar{B}) = BC$

Ans

Date:

4/ $A\bar{B} + A\bar{B}C + A\bar{B}CD + A\bar{B}CDE$

$A\bar{B}(1+C) + A\bar{B}CD + A\bar{B}CDE$ $A\bar{B}$ common

$A\bar{B}(1) + A\bar{B}CD + A\bar{B}CDE \Rightarrow 1+C=1$ (Rule 2)

$A\bar{B}(1+CD) + A\bar{B}CDE$ $A\bar{B}$ common

$A\bar{B}(1) + A\bar{B}CDE$ $1+CD=1$ (Rule 2)

$A\bar{B}(1+CDE)$ $A\bar{B}$ common

$A\bar{B}(1)$ $1+CDE=1$ (Rule 2)

$A\bar{B}$

Ans

Q : 13

Answer

a) $= [(C\bar{D}) + B]A + \bar{A}\bar{B}C = C\bar{D}A + BA + \bar{A}\bar{B}C$

b) $= (A\bar{B}) + (AC\bar{D}) + (A\bar{B}C) = (A\bar{B}) + (AC\bar{D})$

c) $= (C\bar{D}\bar{B}) + A\bar{B}$

d) $= (A\bar{B}) + (AC\bar{D})$

(b) and (d) are

equivalent.

Q : 14

Answer.

a) $(C+D)(A+\bar{D})$ $(A+\bar{D})(C+\bar{D})$

$(A+C\bar{D}+DA+D\bar{D}$

$(\bar{D}+CA+DA+0 \Rightarrow D\bar{D}=0$ (Rule 8)

$C\bar{D}+AD(1+C) \Rightarrow$ factor AD

$C\bar{D}+AD(1) \quad = 1+C=1$ (Rule 2)

$(C\bar{D})+(AD)$ Ans

b) $(A+C)(CD+AC)$

$ACD+AAC+CCD+ACC$

$ACD+AC+CD+AC \Rightarrow AA=A$ (Rule

$ACD+AC+AC+CD$

$ACD+AC+CD \Rightarrow AC+AC=AC$

Date:

$AC(1+D) + CD \Rightarrow$ factor AC

$AC.(1) + CD \Rightarrow 1+D=1$ (Rule 2)

$(AC) + (CD)$

Ans

4) $B+C[BD+\overline{(C+\bar{D})E}]$

$B+C[BD+(\bar{C}E+\bar{D}E)]$ distributive law.

$B+C(BD+CE+\bar{D}E)$

$B+C(BE(D+\bar{D})+(E) \Rightarrow A+\bar{A}=1$ (Rule

$B+C(BE+(E)$

$B+C[CE(1+B)] \Rightarrow$ factor CE

$B+C[CE(1)] \Rightarrow 1+B=1$ (Rule 2)

$B+C(CE)$

$B+CCE \Rightarrow$ Distributive law

$B+CE \Rightarrow CC=C$ (Rule 7)

Ans

d) $A(A\bar{D}+C)$

$A A\bar{D} + AC \Rightarrow$ distributive law

$A\bar{D}+AC \Rightarrow AA=A$ (Rule 7)

e) $BC + DE(B\bar{C}+DE)$

$BC + BDE(B\bar{C}+BE)$

$BC + DEB\bar{C}+DEDE \Rightarrow$ Distributive law

$BC+DEB\bar{C}+DE \Rightarrow DEDE=DE$ (Rule 7)

$BC+DE(1+B\bar{C}) \Rightarrow$ factor DE

$BC+DE(1) = 1+B\bar{C}=1$ (Rule 2)

$BC+DE$ Ans

f) $BC(\bar{C}\bar{D}+CE)$

$BC\bar{C}\bar{D}+BCCE \Rightarrow$ distributive law

$B\bar{D}(C\bar{C})+BE(CC) =$ Rearranged

$BD(0)+BE(C) \Rightarrow C\bar{C}=0$ (Rule 8), $CC=C$ (Rule 7)

Date:

BCE Ans

Q : 15

Answer. →

a) $C\bar{D} + AD$

CD is missing A

$= C\bar{D} = C\bar{D}(A + \bar{A}) \Rightarrow C\bar{D}A + C\bar{D}\bar{A}$

AD is missing C

$= AD = AD(C + \bar{C}) \Rightarrow ADC + AD\bar{C}$

$C\bar{D}A + C\bar{D}\bar{A} + ADC + AD\bar{C}$

Ans

b) $(AC) + ((CD)$

AC is missing D

$= AC = A(C(D + \bar{D}) \Rightarrow ACD + A\bar{C}\bar{D}$

CD is missing A

$= CD = CD(A + \bar{A}) \Rightarrow CDA + CD\bar{A}$

$A\bar{C}D + A\bar{C}\bar{D} + \bar{C}D\bar{A} + CD\bar{A}$

Ans

c) $B + C\bar{E}$

B is missing C and E

$= B = B(C + \bar{C}) = BC + B\bar{C}$

$\Rightarrow BC = BC(E + \bar{E}) \Rightarrow BCE + BC\bar{E}$

$\Rightarrow B\bar{C} = B\bar{C}(E + \bar{E}) \Rightarrow B\bar{C}E + B\bar{C}\bar{E}$

CE is missing B

$\Rightarrow C\bar{E} = C\bar{E}(B + \bar{B}) \Rightarrow C\bar{E}B + C\bar{E}\bar{B}$

$BCE + BC\bar{E} + B\bar{C}E + B\bar{C}\bar{E} + C\bar{E}B + C\bar{E}\bar{B}$

Ans

d/ $\bar{A}\bar{D} + AC$

$A\bar{D}$ is missing C

$\Rightarrow A\bar{D} = A\bar{D}(C + \bar{C}) \Rightarrow A\bar{D}C + A\bar{D}\bar{C}$

AC is missing D

$\Rightarrow AC = AC(D + \bar{D}) \Rightarrow AC\bar{D} + ACD$

$A\bar{D}C + A\bar{D}\bar{C} + ACD + AC\bar{D}$

Answer

e/ $BC + DE$

BC is missing E and D

$\Rightarrow BC = BC(D + \bar{D}) \Rightarrow BCD + BC\bar{D}$

$\Rightarrow BCD = BCD(E + \bar{E}) = BCDE + BC\bar{E}D$

$\Rightarrow BC\bar{D} = BC\bar{D}(E + \bar{E}) = BC\bar{D}E + BC\bar{D}\bar{E}$

DE is missing BC

$\Rightarrow DE = DE(B + \bar{B}) = DEB + DE\bar{B}$

$\Rightarrow DEB = DEB(C + \bar{C}) = DEBC + DEB\bar{C}$

$\Rightarrow \bar{D}\bar{E}\bar{B} = \bar{D}\bar{E}\bar{B}(C+\bar{C}) = \bar{D}\bar{E}\bar{B}C + \bar{D}\bar{E}\bar{B}\bar{C}$

$BCD\bar{E} + BC\bar{D}\bar{E} + BC\bar{D}\bar{E} + BC\bar{D}\bar{E} + \bar{D}\bar{E}\bar{B}C + \bar{D}\bar{E}\bar{B}\bar{C}$

$+ \bar{D}\bar{E}\bar{B}C + \bar{D}\bar{E}\bar{B}\bar{C}$

Ans

f/ BCE

~~BCE is missing~~

BCE is in standard SOP form

Q : 16

Answer.

a/ $C\bar{D}A + C\bar{D}\bar{A} + AD\bar{C} + A\bar{D}\bar{C}$

Sol

$(C+\bar{D}+A)(C+\bar{D}+\bar{A})(A+D+\bar{C})(A+\bar{D}+\bar{C})$

Ans

Date:

b) $A\bar{C}D + AC\bar{D}\bar{C}D\bar{A} + \bar{C}DA$

Solution

$(A + \bar{C} + D)(A + \bar{C} + \bar{D})(\bar{C} + D + A)$

$\bar{C}(\bar{C} + D + \bar{A})$

Ans

c) $BCE + B\bar{C}\bar{E} + B\bar{C}E + B\bar{C}\bar{E} + CEB +$

$\bar{C}E\bar{B}$.

Sol

$(B + C + E)(B + \bar{C} + \bar{E})(B + \bar{C} + E)(B + \bar{C} + \bar{C})$

$(\bar{C} + \bar{E} + B)(\bar{C} + \bar{E} + \bar{B})$

Ans

d) $A\bar{D}C + A\bar{D}\bar{C} + A\bar{C}D + A\bar{C}\bar{D}$

Sol

$(A + \bar{D} + C)(A + \bar{D} + \bar{C})(A + \bar{C} + D)(A + \bar{C} + \bar{D})$

Ans

e) $B\bar{C}D\bar{E} + B\bar{C}DE + B\bar{C}\bar{D}E + B\bar{C}\bar{D}\bar{E} + \bar{D}EBC +$

$D\bar{E}B\bar{C} + D\bar{E}\bar{D}C + D\bar{E}\bar{B}\bar{C}$

Solution: →

$(B+C+D+E)(B+C+D+\bar{E})(B+C+\bar{D}+E)$

$(\bar{D}+E+B+C)(D+E+\bar{B}+C)(D+\bar{E}+\bar{B}+C)$

$(D+E+\bar{E}+C)$

Answer.

f) $BC\bar{E}$

$(B+C+\bar{E})$

Answer.

Date:

Q:11

Answer

a)

A	C	D	X	
0	0	0	0	
0	0	1	0	
0	1	0	1	$\bar{A}C\bar{D}$
0	1	1	0	
1	0	0	0	
1	0	1	1	$A\bar{C}D$
1	1	0	1	$AC\bar{D}$
1	1	1	1	ACD

b)

A	C	D	X	
0	0	0	0	
0	0	1	0	
0	1	0	0	
0	1	1	1	$\bar{A}CD$
1	0	0	0	
1	0	1	0	
1	1	0	1	$AC\bar{D}$
1	1	1	1	ACD

c)

B	C	E	X	
0	0	0	0	
0	0	1	0	
0	1	0	0	
0	1	1	1	$\bar{B}C\bar{E}$
1	0	0	1	$B\bar{C}\bar{E}$
1	0	1	1	$B\bar{C}E$
1	1	0	1	$BC\bar{E}$
1	1	1	1	BCE

d)

A	C	D	X	
0	0	0	0	
0	0	1	0	
0	1	0	0	
0	1	1	0	
1	0	0	1	$A\bar{C}\bar{D}$
1	0	1	0	
1	1	0	1	$AC\bar{D}$
1	1	1	1	ACD

e/

B	C	D	E	X	
0	0	0	0	0	
0	0	0	1	0	
0	0	1	0	0	
0	0	1	1	1	$\bar{B}CDE$
0	1	0	0	0	
0	1	0	1	0	
0	1	1	0	0	
0	1	1	1	1	$\bar{B}CDE$
1	0	0	0	0	
1	0	0	1	0	
1	0	1	0	0	
1	0	1	1	1	$B\bar{C}DE$
1	1	0	0	1	$BC\bar{D}E$
1	1	0	1	1	$BC\bar{D}E$
1	1	1	0	1	$BCD\bar{E}$
1	1	1	1	1	$BCDE$

f/

B	C	E	X	
0	0	0	0	
0	0	1	0	
0	1	0	0	
0	1	1	0	
1	0	0	0	
1	0	1	0	
1	1	0	0	
1	1	1	1	BCE

Q: 18

Answer.

a/

A	C	D	X	
0	0	0	0	$(A+C+D)$
0	0	1	0	$(A+C+\bar{D})$
0	1	0	0	$(\bar{A}+C+D)$
0	1	1	1	
1	0	0	1	
1	0	1	0	$(A+\bar{C}+D)$
1	1	0	1	
1	1	1	1	

b/

A	C	D	X	
0	0	0	0	$(A+C+D)$
0	0	1	0	$(A+C+\bar{D})$
0	1	0	1	
0	1	1	1	
1	0	0	0	$(\bar{A}+C+D)$
1	0	1	1	
1	1	0	1	
1	1	1	1	

c)

B	C	E	X	
0	0	0	0	$(B+C+E)$
0	0	1	0	$(B+C+\bar{E})$
0	1	0	0	$(B+\bar{C}+E)$
0	1	1	0	$(B+\bar{C}+\bar{E})$
1	0	0	0	$(\bar{B}+C+E)$
1	0	1	1	
1	1	0	1	
1	1	1	1	

d)

A	C	D	X	
0	0	0	0	$(A+C+D)$
0	0	1	0	$(A+C+\bar{D})$
0	1	0	1	
0	1	1	0	$(A+\bar{C}+\bar{D})$
1	0	0	1	
1	0	1	1	
1	1	0	1	
1	1	1	1	

e)

B	C	D	E	X	
0	0	0	0	0	$(B+C+D+E)$
0	0	0	1	0	$(B+C+D+\bar{E})$
0	0	1	0	0	$(B+C+\bar{D}+E)$
0	0	1	1	0	$(B+C+\bar{D}+\bar{E})$
0	1	0	0	0	$(B+\bar{C}+D+E)$
0	1	0	1	1	
0	1	1	0	1	
0	1	1	1	1	
1	0	0	0	0	$(\bar{B}+C+D+E)$
1	0	0	1	1	
1	0	1	0	1	
1	0	1	1	1	
1	1	0	0	0	$(\bar{B}+\bar{C}+D+E)$
1	1	0	1	1	
1	1	1	0	1	
1	1	1	1	1	

f)

B	C	E	X	
0	0	0	0	$(B+C+E)$
0	0	1	1	
0	1	0	1	
0	1	1	1	
1	0	0	1	
1	0	1	1	
1	1	0	1	
1	1	1	1	

Q: 19

Answer: →

A	B	C	D	X	
0	0	0	0	1	$(\bar{A}\bar{B}\bar{C}\bar{D})$
0	0	0	1	1	$(\bar{A}\bar{B}\bar{C}D)$
0	0	1	0	0	$(A+B+\bar{C}+D)$
0	0	1	1	1	$(\bar{A}\bar{B}C\bar{D})$
0	1	0	0	0	$(A+\bar{B}+\bar{C}+D)$
0	1	0	1	1	$(\bar{A}B\bar{C}\bar{D})$
0	1	1	0	1	$(\bar{A}B\bar{C}D)$
0	1	1	1	0	$(A+\bar{B}+\bar{C}+\bar{D})$
1	0	0	0	0	$(A+B+C+D)$
1	0	0	1	1	$(A\bar{B}\bar{C}D)$
1	0	1	0	0	$(\bar{A}+B+\bar{C}+D)$
1	0	1	1	0	$(\bar{A}+B+\bar{C}+\bar{D})$
1	1	0	0	1	$(A\bar{B}\bar{C}\bar{D})$
1	1	0	1	0	$(\bar{A}+\bar{B}+C+D)$
1	1	1	0	0	$(\bar{A}+\bar{B}+\bar{C}+D)$
1	1	1	1	0	$(\bar{A}+\bar{B}+\bar{C}+\bar{D})$

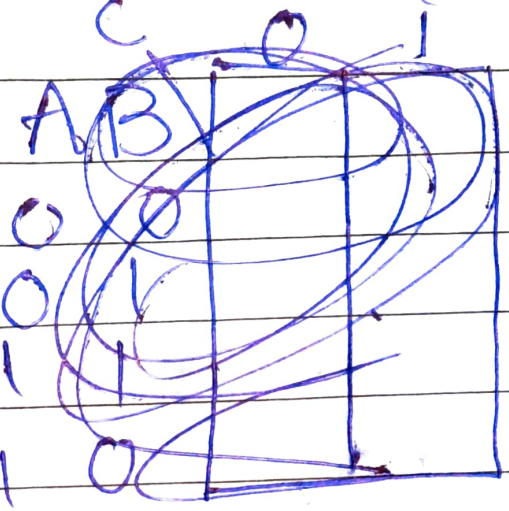
Q:20

Answer

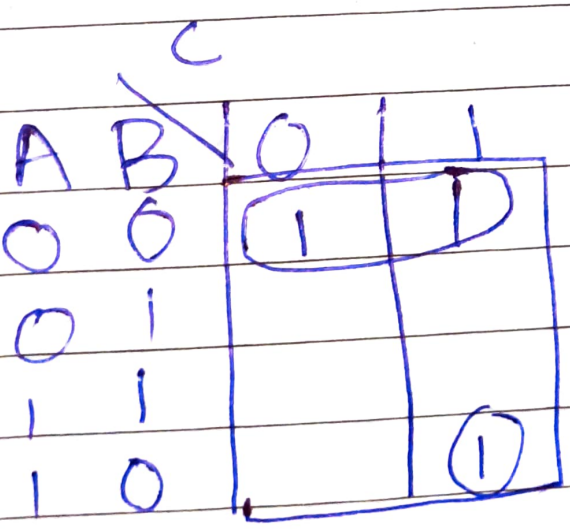
a/ $\bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + A\bar{B}C$

0 0 0 0 0 1 1 0 1

$(\bar{A}\bar{B}) + (A\bar{B}C)$



~~AB~~.



b) $AC(\bar{B}+C) = AC\bar{B} + AC$

AC is missing B

$\Rightarrow AC = AC(B+\bar{B}) \Rightarrow ACB + AC\bar{B}$

$= AC\bar{B} + ACB + AC\bar{B} \Rightarrow AC\bar{B} + ACB = AC\bar{B}$

$= AC\bar{B} + ACB$

$110 \quad 111$

AC \ B	0	1
00		
01		
11	0	1
10		

$\Rightarrow (AC)$

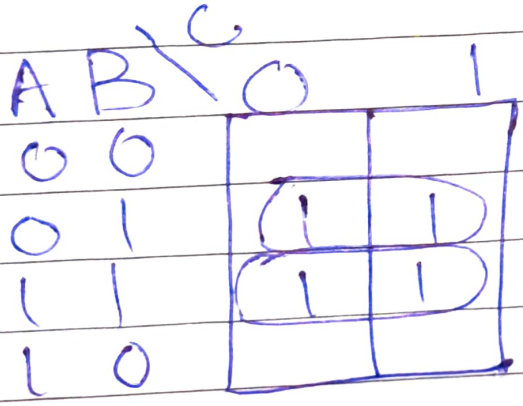
Answer

Date:_____

c) $A(BC + B\bar{C}) + \bar{A}(BC + B\bar{C})$

$\bar{A}BC + \bar{A}B\bar{C} + ABC + AB\bar{C}$

011 010 111 110

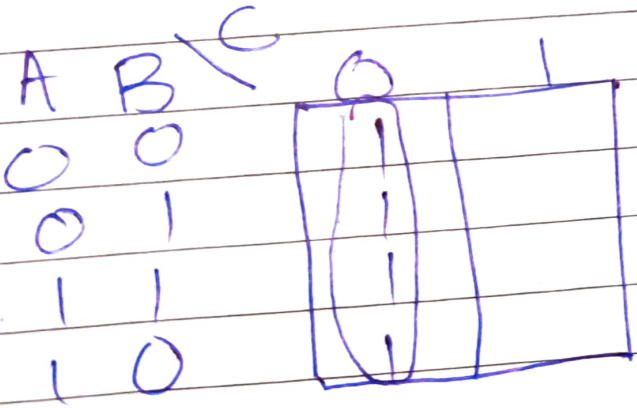


$= (B)$

Answer

d) $\bar{A}\bar{B}\bar{C} + AB\bar{C} + \bar{A}B\bar{C} + AB\bar{C}$

000 100 010 110



$= (-)$

Ans

e/ $A + B\bar{C} + CD$

A is missing BCD

$A = A(B+\bar{B}) = AB + A\bar{B}$

$A\bar{B} = AB(C+\bar{C}) = AB\bar{C} + A\bar{B}\bar{C}$,

$AB = AB(C+\bar{C}) = ABC + AB\bar{C}$

$AB\bar{C} = AB\bar{C}(D+\bar{D}) = AB\bar{C}D + AB\bar{C}\bar{D}$ ①

$ABC = ABC(D+\bar{D}) = ABCD + ABC\bar{D}$ ①

$A\bar{B}\bar{C} = A\bar{B}\bar{C}(D+\bar{D}) = A\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D}$ ①

$AB\bar{C} = AB\bar{C}(D+\bar{D}) = AB\bar{C}D + AB\bar{C}\bar{D}$ ①

BC is missing AD

$B\bar{C} = B\bar{C}(A+\bar{A}) = B\bar{C}A + B\bar{C}\bar{A}$

$B\bar{C}A = B\bar{C}A(D+\bar{D}) = BCAD + B\bar{C}A\bar{D}$ ①

$B\bar{C}\bar{A} = B\bar{C}\bar{A}(B+\bar{D}) = B\bar{C}\bar{A}D + B\bar{C}\bar{A}\bar{D}$ ①

CD is missing AB

Date:

$AB = AB(C+\bar{C}) = ABC + AB\bar{C}$

$ABC = ABC(D+\bar{D}) = ABCD + ABC\bar{D}$

$AB\bar{C} = AB\bar{C}(D+\bar{D}) = AB\bar{C}D + AB\bar{C}\bar{D}$

$= A\bar{B}CD + A\bar{B}C\bar{D} + AB\bar{C}D + ABC\bar{D} + \bar{A}B\bar{C}D + AB\bar{C}\bar{D}$

1011 1010 1111 1110 1001 1000

~~$+ A\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D} + AB\bar{C}\bar{D} + AB\bar{C}D$~~

~~$+ ABCD + ABC\bar{D}$~~

$+ AB\bar{C}D + ABC\bar{D} + B\bar{C}AD + B\bar{C}A\bar{D}$

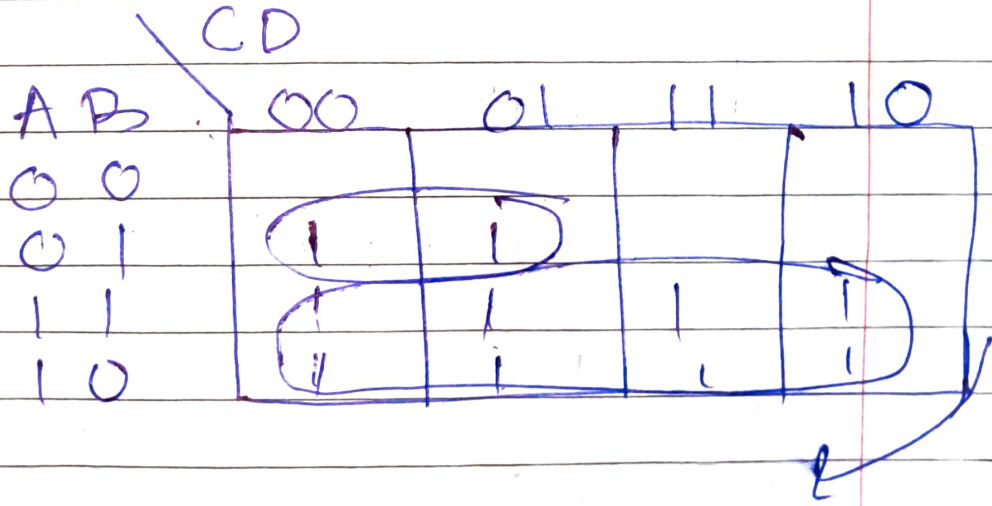
1101 1100 1011 1010

$+ B\bar{C}\bar{A}D + B\bar{C}\bar{A}\bar{D} + AB\bar{C}\bar{D} + ABCD$

1001 1000 1110 1111

$+ AB\bar{C}D + AB\bar{C}\bar{D}$

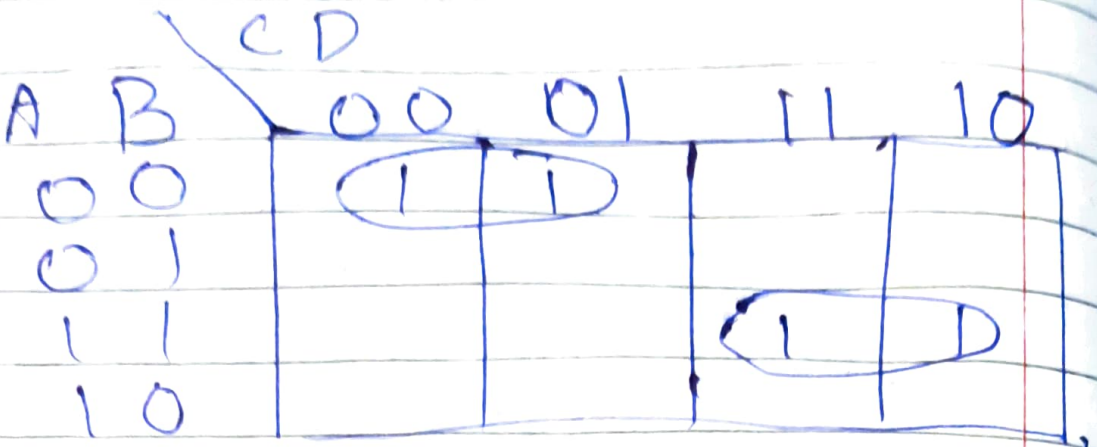
1101 1100



$= (\bar{A}B) + (A)$

Ans

f) $\bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + \bar{A}\bar{B}C\bar{D} + \bar{A}\bar{B}CD$



$= (\bar{A}\bar{B}) + (A\bar{B})$

g) $\bar{A}\bar{B} + A\bar{B} + \bar{C}\bar{D} + (\bar{D})$

$\bar{A}\bar{B}$ is missing (D)

$\bar{A}\bar{B} = \bar{A}\bar{B}\bar{C}(+\bar{C}) = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C$

$\bar{A}\bar{B}\bar{C} = \bar{A}\bar{B}\bar{C}(D+\bar{D}) = \bar{A}\bar{B}\bar{C}D + \bar{A}\bar{B}\bar{C}\bar{D}$ ①

$\bar{A}\bar{B}C = \bar{A}\bar{B}C(D+\bar{D}) = \bar{A}\bar{B}CD + \bar{A}\bar{B}C\bar{D}$ ②

$A\bar{B}$ is missing (D)

$\Rightarrow A\bar{B} = A\bar{B}CD + A\bar{B}C\bar{D} + A\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D}$ ③

$C\bar{D}$ is missing AB

$C\bar{D} = AB\bar{C}D + AB\bar{C}\bar{D} + A\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D}$

$\bar{C}\bar{D}$ is missing AB

$$\overline{CD} = \bar{A}\bar{B}\overline{CD} + \bar{A}B\overline{CD} + \bar{A}B\overline{CD} + \bar{A}B\overline{CD} + \bar{A}B\overline{CD}$$

$$= \bar{A}\bar{B}\overline{CD} + \bar{A}\bar{B}C\overline{D} + \bar{A}\bar{B}\overline{CD} + \bar{A}B\overline{CD}$$

0011 0010 0001 0000

$$+ A\bar{B}\overline{CD} + A\bar{B}C\overline{D} + AB\overline{CD}$$

1011 1010 1001

$$+ A\bar{B}\overline{CD} + AB\bar{C}\overline{D} + \bar{A}B\overline{CD} + AB\overline{CD}$$

1000 1100 0101 1000

$$+ \bar{A}B\overline{CD} + AB\overline{CD} + A\bar{B}\overline{CD}$$

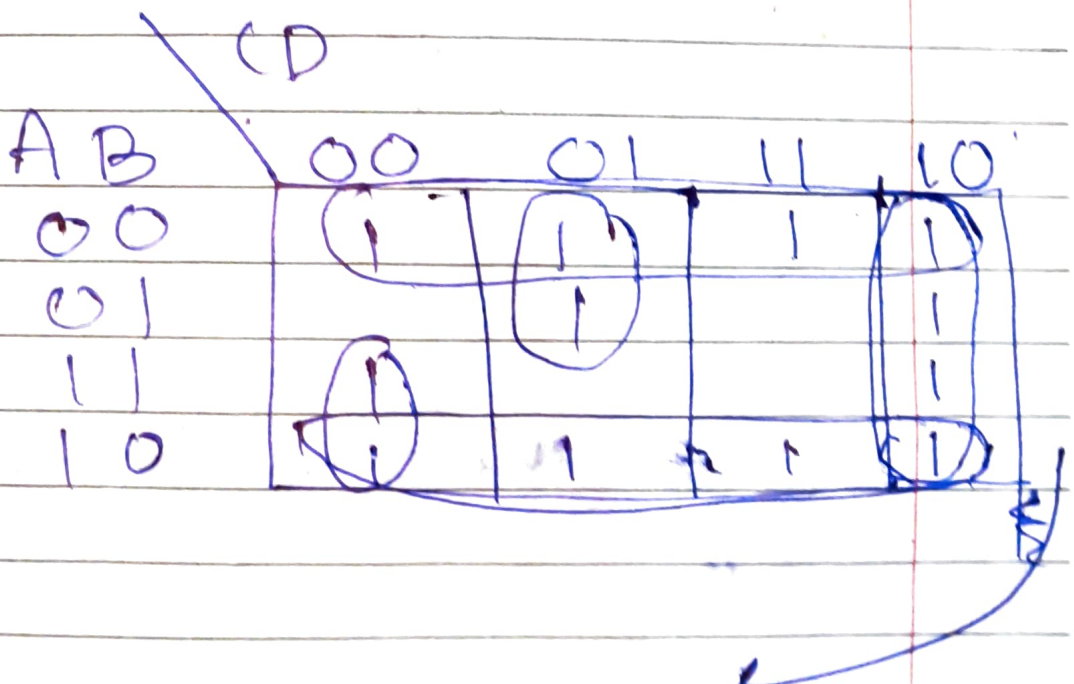
0000 1110 ~~1001~~

$$+ A\bar{B}C\overline{D} + \bar{A}BC\overline{D}$$

0110

1010 0010

$=$

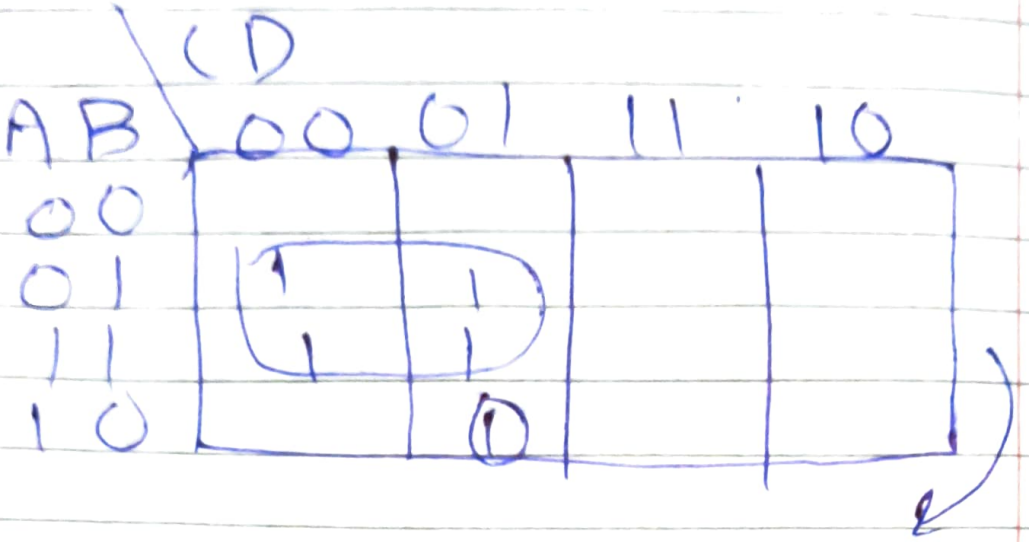


$$= (\bar{A}B) + (\bar{A}B) + (AA) + (A\bar{B})$$

h) $\bar{A}B(\bar{C}\bar{D}+C\bar{D})+\bar{A}B(\bar{C}D+CD)+\bar{A}BC\bar{D}$

$= \bar{A}B\bar{C}\bar{D}+\bar{A}BC\bar{D}+AB\bar{C}\bar{D}+AB\bar{C}D+\bar{A}BCD$

0100 0101 1100 1101 1001



$= (B) + (A\bar{B}\bar{C}D)$

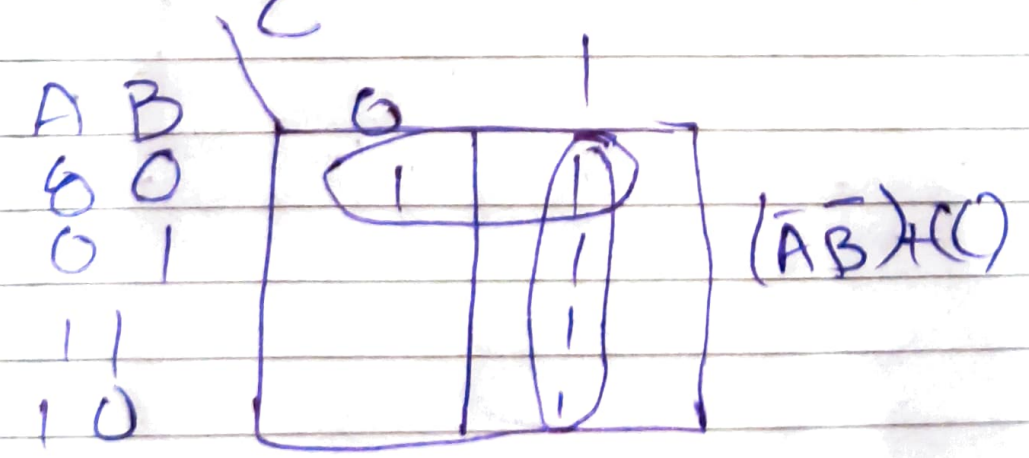
Ans

Q : 71

ANSWER

$(\bar{A}\bar{B}\bar{C}) + (\bar{A}\bar{B}C) + (\bar{A}B\bar{C}) + (A\bar{B}C) + (ABC)$

000 001 011 101 111



Q : 22

Answer

$\bar{A}\bar{B}\bar{C}D + \bar{A}\bar{B}C\bar{D} + \bar{A}BC\bar{D} + \bar{A}BCD$

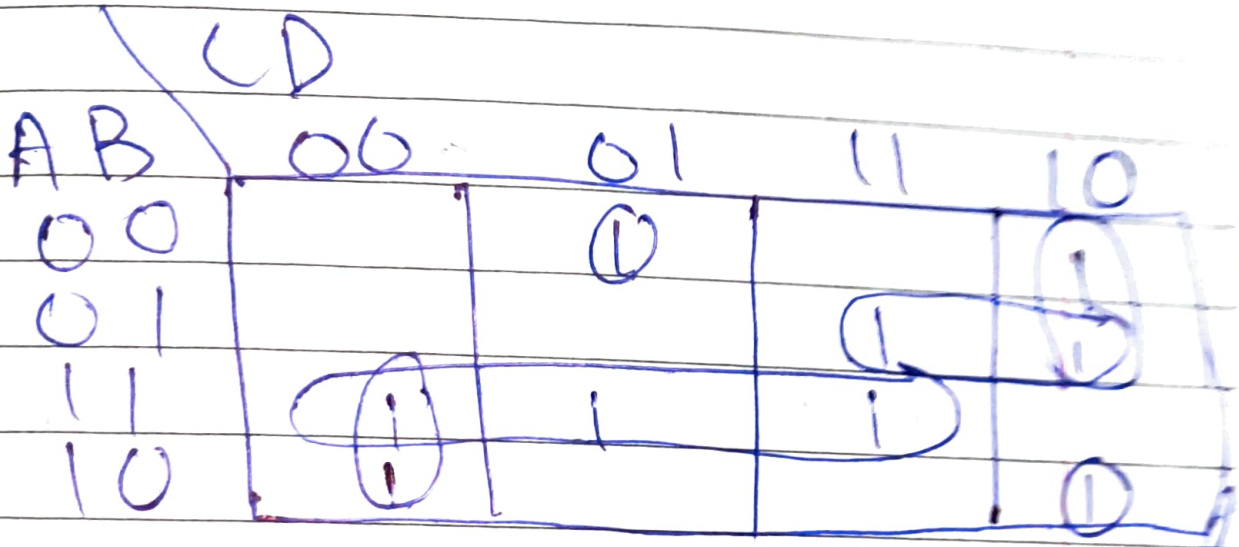
0 001 — 0010 — 0101 — 0111

$+ A\bar{B}\bar{C}D + A\bar{B}C\bar{D} + A\bar{B}CD + ABC\bar{D}$

1000 — 1010 — 1100

$+ AB\bar{C}D + ABC\bar{D} + ABCD$

1101 — 1110 — 1111



$= (\bar{A}\bar{B}\bar{C}D) + (A\bar{C}\bar{D}) + (\bar{A}\bar{B})$

$+ (AB) + A\bar{C}\bar{D} + (A\bar{B}CD)$

Ans

Q :→ 23

Answer

a)

(A + B + C) (Ā + B̄ + C̄) (A + B̄ + C)

0 0 0 1 1 1 0 1 0

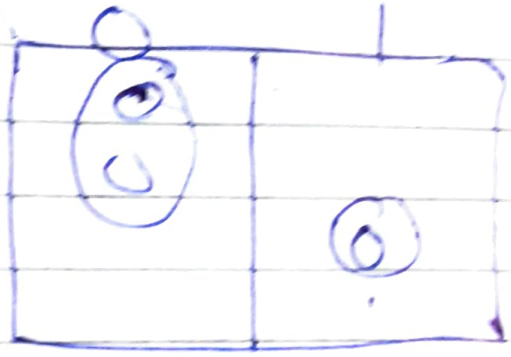
A B C

0 0 0

0 1 1

1 1 0

1 0 0



= (A + C) (AB̄C̄)

Ans

b) $(X+\bar{Y})(\bar{X}+Z)(X+\bar{Y}+Z)(\bar{X}+Y+Z)$

$X+\bar{Y}$ is missing Z

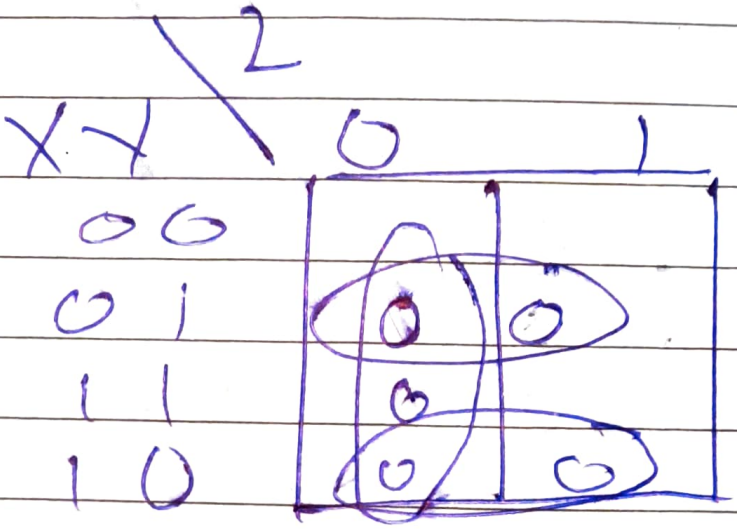
$X+\bar{Y} = X+\bar{Y}+(Z\bar{Z}) = (X+\bar{Y}+Z)(X+\bar{Y}+\bar{Z})$

$\bar{X}+Z$ is missing y

$\bar{X}+Z = \bar{X}+Z+(y\bar{y}) = (\bar{X}+y+Z)(\bar{X}+\bar{y}+Z)$

$= (X+\bar{Y}+Z)\ (X+\bar{Y}+\bar{Z})\ (\bar{X}+Y+Z)\ (\bar{X}+\bar{Y}+Z)$
$\quad 0\ 1\ 0 \qquad 0\ 1\ 1 \qquad 1\ 0\ 0 \qquad 1\ 1\ 0$

$+ (X+\bar{Y}+Z) \qquad (\bar{X}+\bar{Y}+Z)$
$\quad 1\ 0\ 1 \qquad\qquad 1\ 1\ 0$



$= (X+\bar{Y})(Z)(\bar{X}\bar{Y})$

Ans

1/ $A(B+\bar{C})(\bar{A}+C)(A+\bar{B}+C)(\bar{A}+B+\bar{C})$

AB is missing $B+C$

$A = (A+B+C)(A+\bar{B}+C)(A+B+\bar{C})$

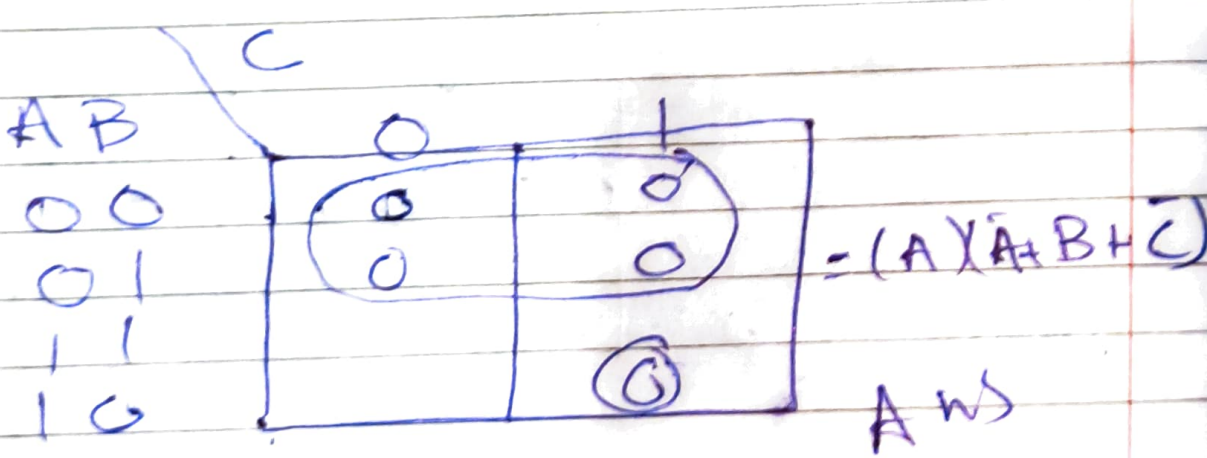
$B+\bar{C}$ is missing A

$B+\bar{C} = (A+B+\bar{C})(\bar{A}+B+\bar{C})$

$= (A+B+C)(A+\bar{B}+C)(A+B+\bar{C})$
0 0 0 0 1 0 0 0 1

$(A+B+\bar{C})(A+B+C)(\bar{A}+B+C)$
0 1 1 0 0 1 1 0 1

$(\bar{A}+\bar{B}+C)(\bar{A}+B+\bar{C})$
0 1 0 1 0 0



AWS

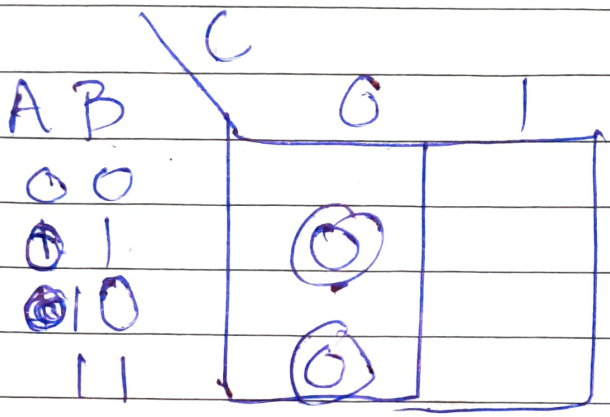
Date:_____

Q :→ 24

Answer

$(A+\bar{B}+C)$ $(\bar{A}+\bar{B}+C)$

0 1 0 1 1 0



$\Rightarrow (A+\bar{B}+C)(\bar{A}+\bar{B}+C)$

Ans

Q :→ 25

Answer

$(A+B+C+D)$ $(A+B+\bar{C}+\bar{D})$ $(A+\bar{B}+C+D)$

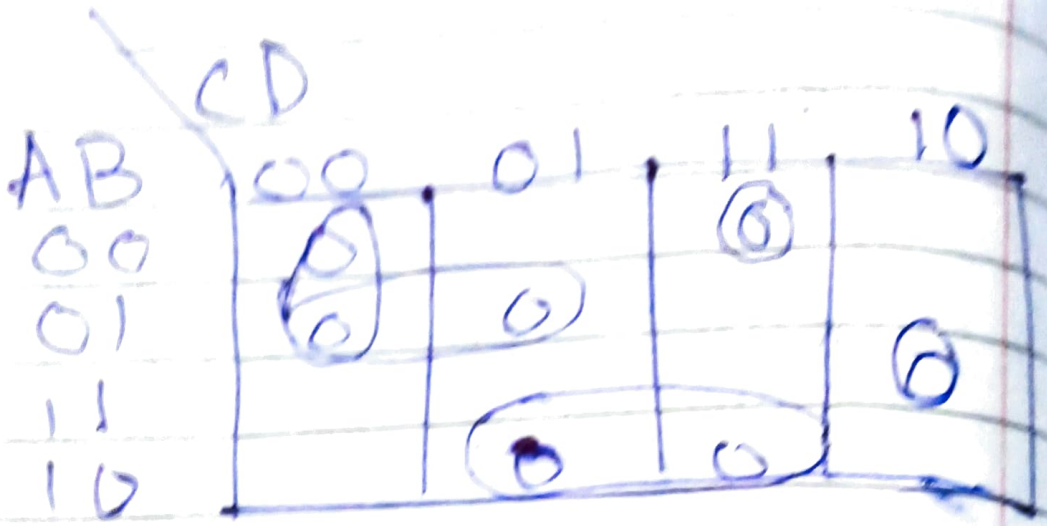
0 0 0 0 0 0 1 1 0 1 0 0

$(A+\bar{B}+C+\bar{D})$ $(\bar{A}+B+C+\bar{D})$

0 1 0 1 1 0 0 1

$(\bar{A}+B+\bar{C}+D)$ $(A+\bar{B}+\bar{C}+D)$

1 0 1 1 1 1 1 0



$(A+C+D)(A+\bar{B}+C)(A+\bar{B}+\bar{C}+D)$

$(\bar{A}+\bar{B}+\bar{C}+D)(\bar{A}+B+\bar{D})$

Ans

Q : 26

Answer

a) $(A+\bar{B})(A+\bar{C})(\bar{A}+\bar{B}+C)$

$A+\bar{B}$ is missing C

$A+\bar{B} = (A+\bar{B}+C)(A+\bar{B}+\bar{C})$

$A+\bar{C}$ is missing B

$A+\bar{C} = (A+B+\bar{C})(A+\bar{B}+\bar{C})$

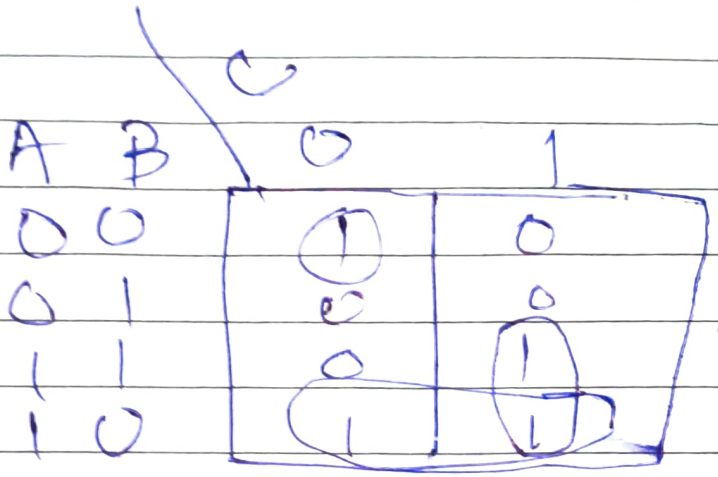
Date:

$(\bar{A}+\bar{B}+C)$ $(A+\bar{B}+\bar{C})$ $(A+B+\bar{C})$

0 1 0 1 0 0 1

$(A+\bar{B}+\bar{C})$ $(\bar{A}+B+C)$

0 1 1 1 1 0



$= (A\bar{B}\bar{C}) +$

$(AC) + (A\bar{B})$

Ans

b) $(\bar{A}+B)$ $(\bar{A}+\bar{B}+C)$ $(B+\bar{C}+D)$

$(\bar{A}+\bar{B}+\bar{C}+\bar{D})$

$\bar{A}+B$ is missing (and)

$\bar{A}+B = (\bar{A}+B+C+D)(\bar{A}+B+\bar{C}+D)$

$(\bar{A}+B+C+D)(A+B+C+\bar{D})$

$\bar{A}+\bar{B}+C$ is missing D

$\bar{A}+\bar{B}+\bar{C}=(\bar{A}+\bar{B}+\bar{C}+D)(\bar{A}+\bar{B}+\bar{C}+\bar{D})$

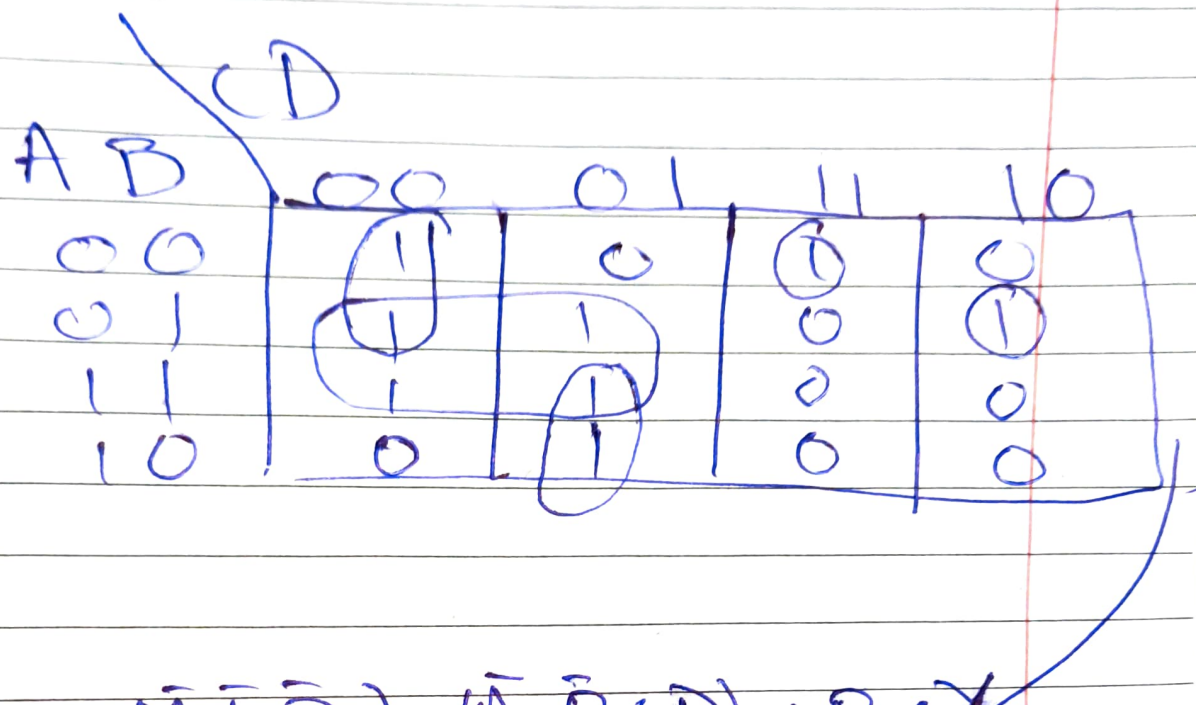
$B+\bar{C}+D$ is missing A

$B+\bar{C}+D=(A+B+\bar{C}+D)(\bar{A}+B+\bar{C}+D)$

$=(\bar{A}+B+\bar{C}+D)(\bar{A}+B+\bar{C}+D)$
$(\bar{A}+B+\bar{C}+D)(A+B+\bar{C}+D)$
$(\bar{A}+\bar{B}+\bar{C}+D)(A+B+\bar{C}+D)$
$(\bar{A}+B+\bar{C}+D)(A+\bar{B}+\bar{C}+D)$

$=(\bar{A}+B+\bar{C}+D)(\bar{A}+B+\bar{C}+\bar{D})$
$(\bar{A}+B+\bar{C}+\bar{D})(\bar{A}+B+C+\bar{D})$
$(\bar{A}+\bar{B}+\bar{C}+\bar{D})(\bar{A}+B+\bar{C}+D)$
$(\bar{A}+B+C+\bar{D})(A+B+\bar{C}+D)$
$(\bar{A}+B+\bar{C}+D)(A+B+C+D)$
$(A+B+\bar{C}+D)(A+B+C+D)$
$(\bar{A}+B+C+D)(A+B+C+D)$
$(A+\bar{B}+\bar{C}+D)(A+B+C+D)$
$(A+B+\bar{C}+D)(A+B+C+D)$
$(A+B+C+\bar{D})(A+B+C+D)$
$(A+B+C+D)(A+B+C+D)$

Date:_____



$= (\bar{A}\bar{C}\bar{D}) + (\bar{A}\bar{B}C\bar{D}) + B\bar{C}$

$+ (\bar{A}BC\bar{D}) + (AC\bar{D})$

Ans