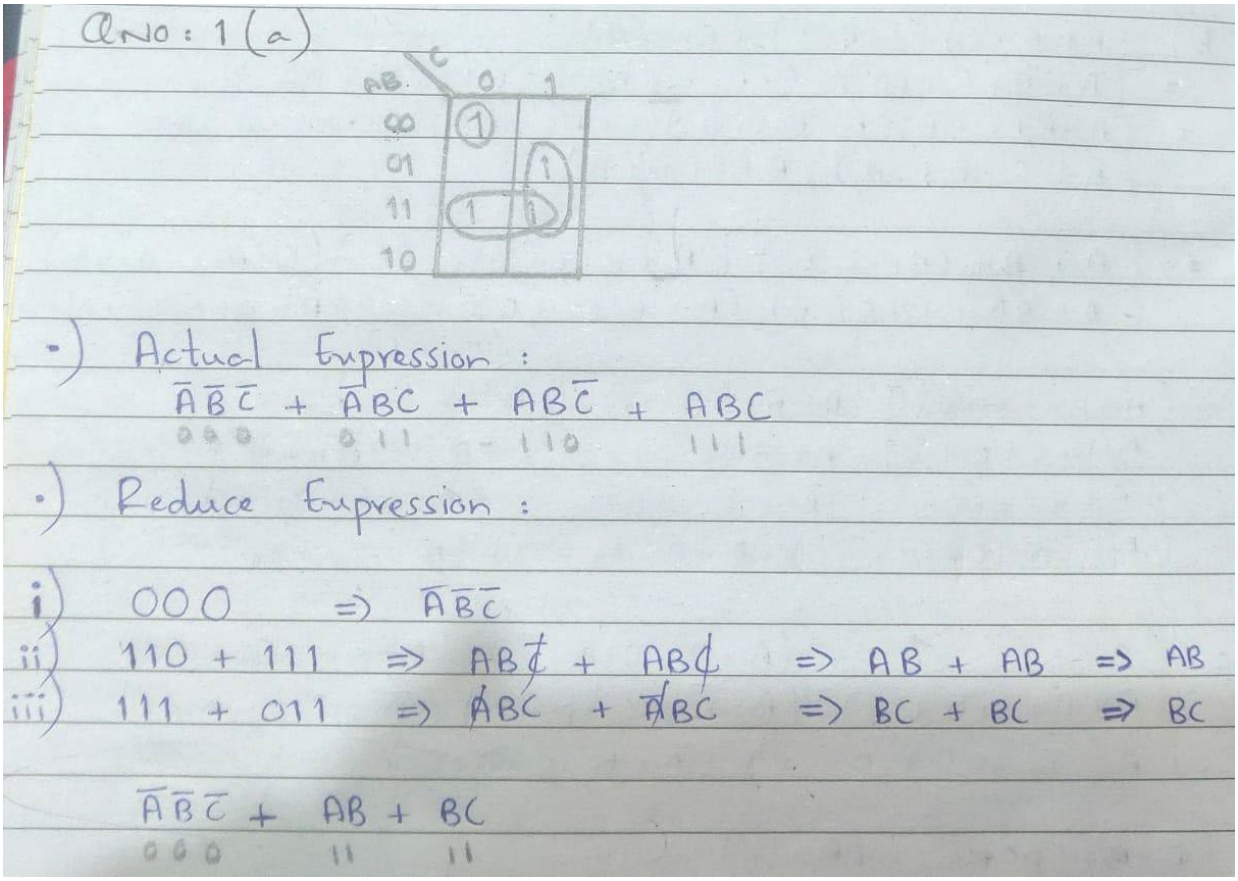
NAME : MAHAD SHAHNAWAZ

ROLL NO. : 24K-3057

DLB LAB TASK 4

QUESTION:01(a)



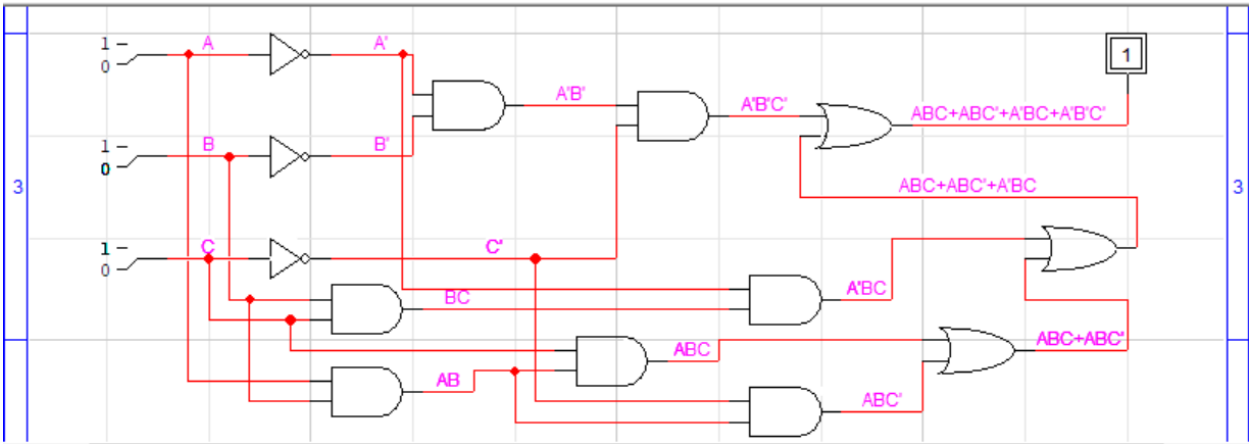
TRUTH TABLE (ACTUAL EXPRESSION):

A	B	C	A’	B’	C’	A’B’C’	A’BC	ABC’	ABC	A’B’C’+A’BC+ABC’+ABC
0	0	0	1	1	1	1	0	0	0	1
0	0	1	1	1	0	0	0	0	0	0
0	1	0	1	0	1	0	0	0	0	0
0	1	1	1	0	0	0	1	0	0	1
1	0	0	0	1	1	0	0	0	0	0
1	0	1	0	1	0	0	0	0	0	0
1	1	0	0	0	1	0	0	1	0	1
1	1	1	0	0	0	0	0	0	1	1

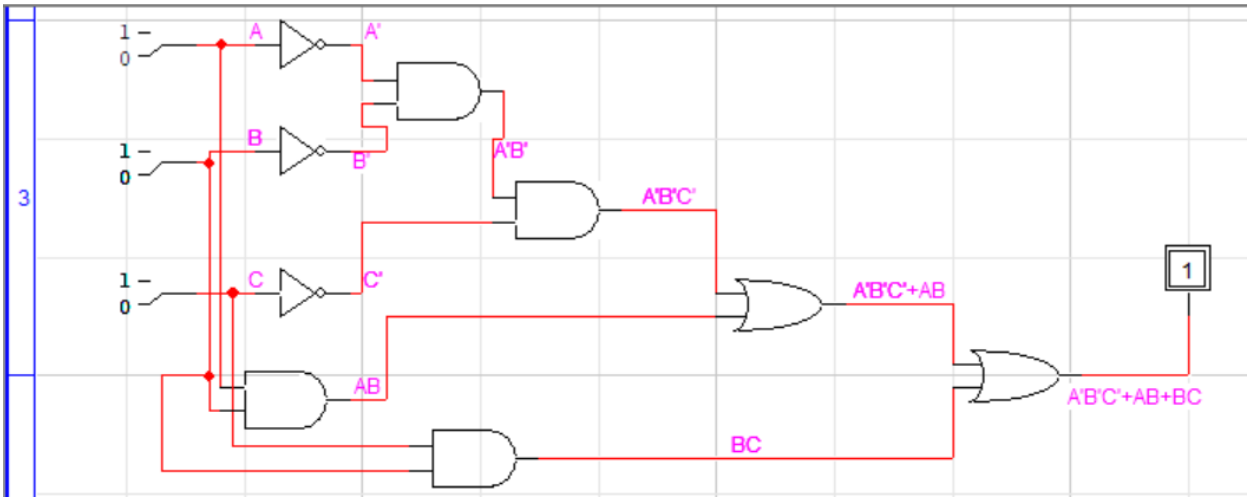
TRUTH TABLE (REDUCE EXPRESSION):

A	B	C	A’	B’	C’	AB	BC	A’B’C’	A’B’C’+AB+BC
0	0	0	1	1	1	0	0	1	1
0	0	1	1	1	0	0	0	0	0
0	1	0	1	0	1	0	0	0	0
0	1	1	1	0	0	0	1	0	1
1	0	0	0	1	1	0	0	0	0
1	0	1	0	1	0	0	0	0	0
1	1	0	0	0	1	1	0	0	1
1	1	1	0	0	0	1	1	0	1

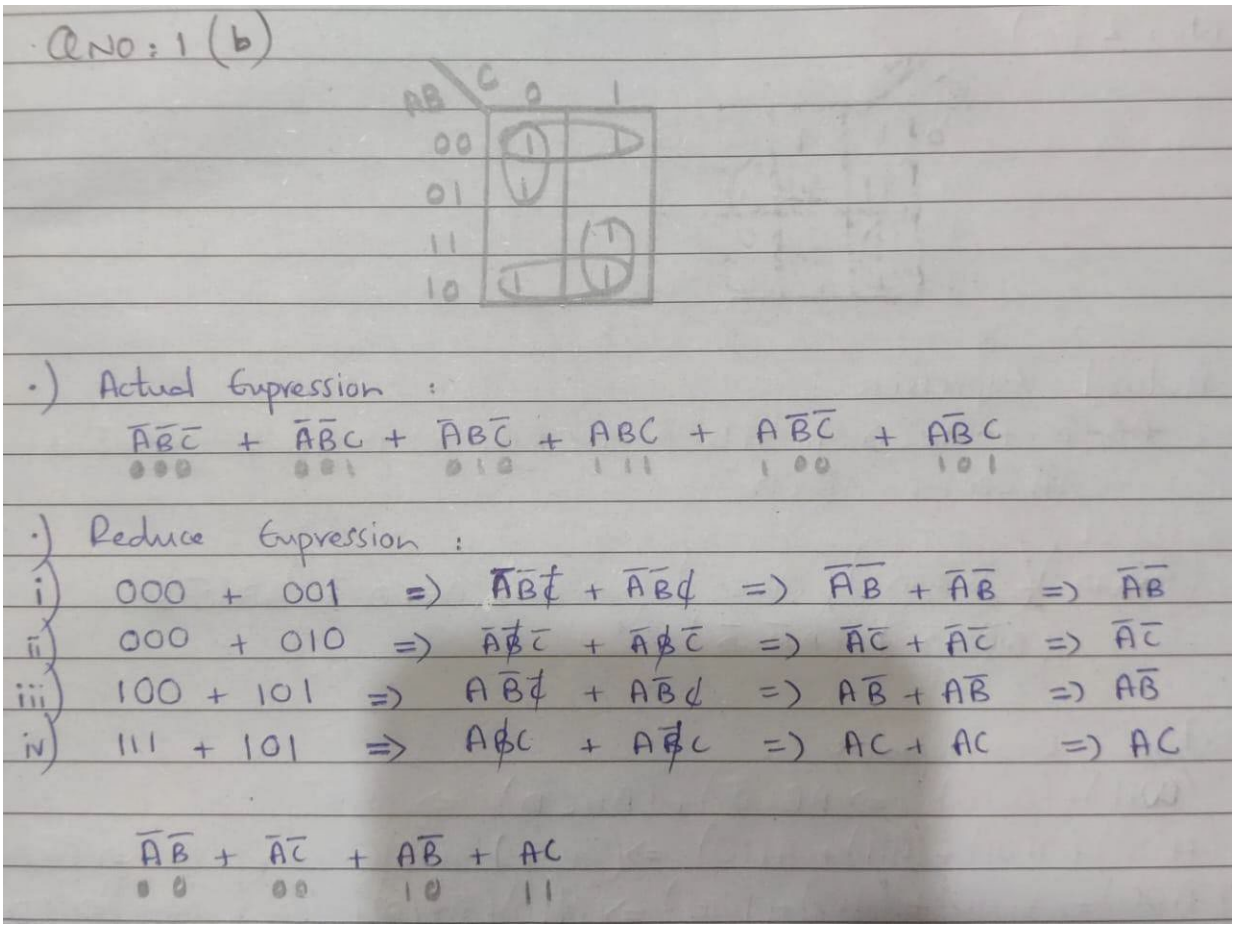
CIRCUIT FIGURE (ACTUAL EXPRESSION):



CIRCUIT FIGURE (REDUCE EXPRESSION):



QUESTION:01(b)



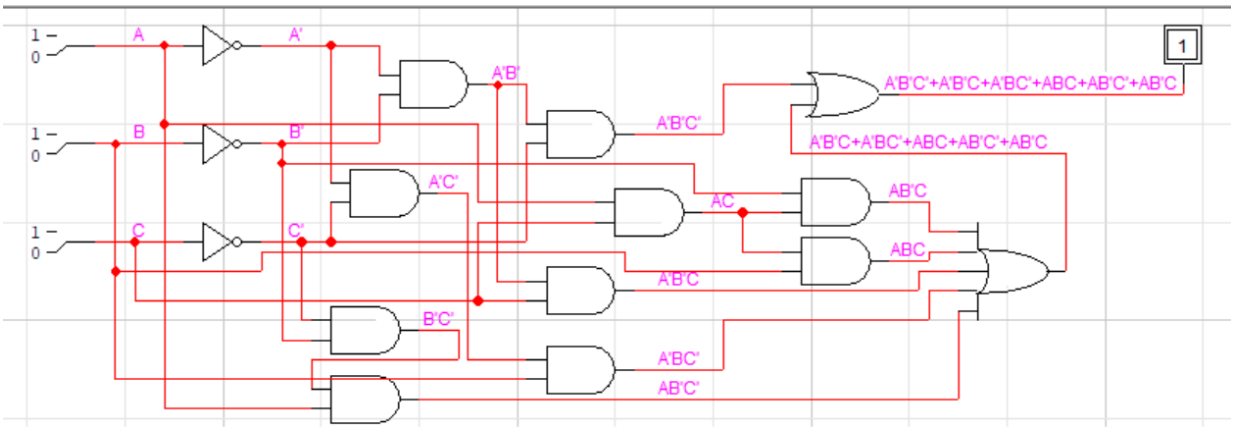
TRUTH TABLE (ACTUAL EXPRESSION):

A	B	C	A’	B’	C’	ABC	A’B’C’	A’B’C	A’BC’	AB’C’	AB’C	A’B’C’+A’B’C+A’BC’ +ABC+AB’C’+AB’C
0	0	0	1	1	1	0	1	0	0	0	0	1
0	0	1	1	1	0	0	0	1	0	0	0	1
0	1	0	1	0	1	0	0	0	1	0	0	1
0	1	1	1	0	0	0	0	0	0	0	0	0
1	0	0	0	1	1	0	0	0	0	1	0	1
1	0	1	0	1	0	0	0	0	0	0	1	1
1	1	0	0	0	1	0	0	0	0	0	0	0
1	1	1	0	0	0	1	0	0	0	0	0	1

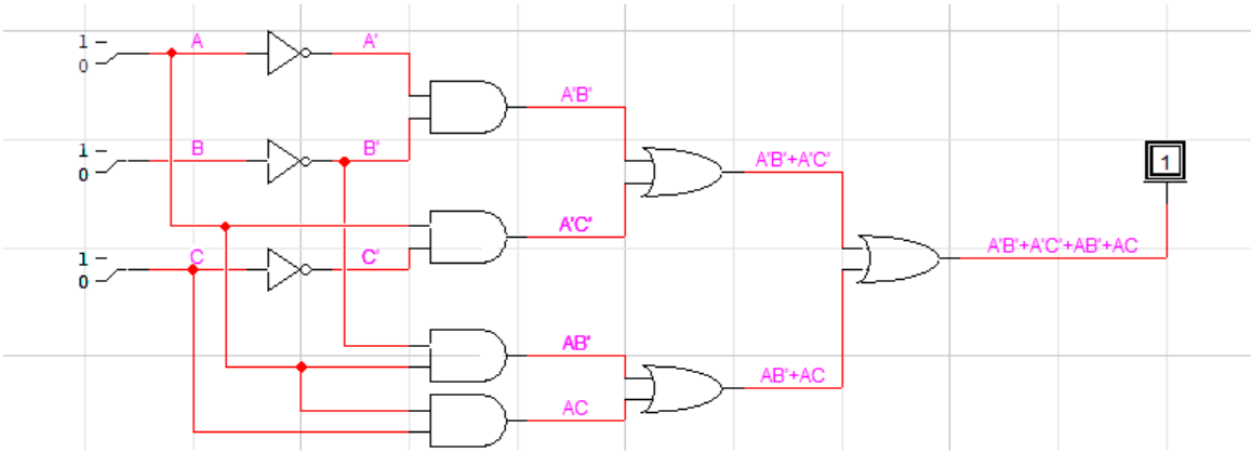
TRUTH TABLE (REDUCE EXPRESSION):

A	B	C	A’	B’	C’	A’B’	A’C’	AB’	AC	A’B’+A’C’+AB’+AC
0	0	0	1	1	1	1	1	0	0	1
0	0	1	1	1	0	1	0	0	0	1
0	1	0	1	0	1	0	1	0	0	1
0	1	1	1	0	0	0	0	0	0	0
1	0	0	0	1	1	0	0	1	0	1
1	0	1	0	1	0	0	0	1	1	1
1	1	0	0	0	1	0	0	0	0	0
1	1	1	0	0	0	0	0	1	1	1

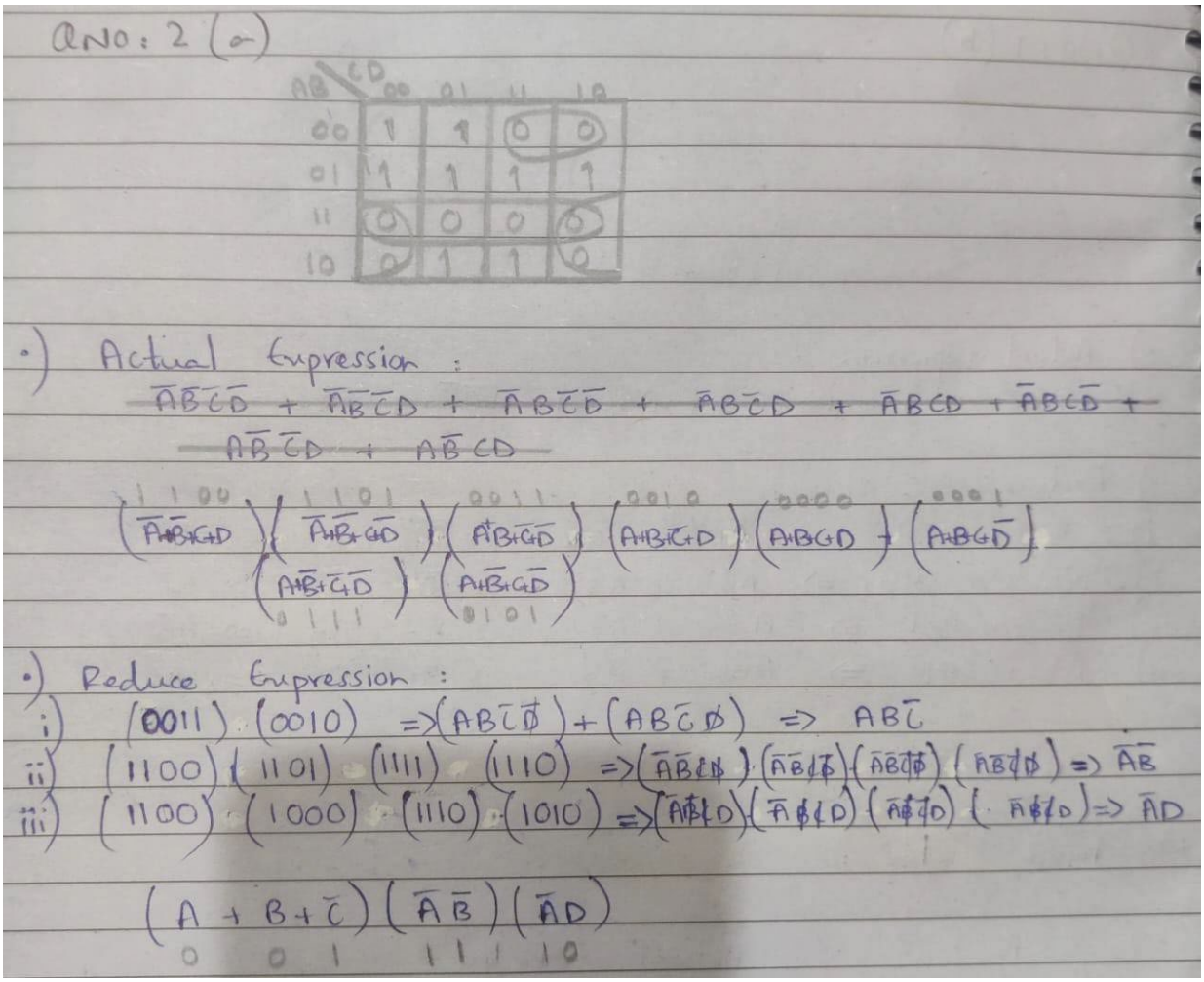
CIRCUIT FIGURE (ACTUAL EXPRESSION):



CIRCUIT FIGURE (REDUCE EXPRESSION):



QUESTION:02(a)



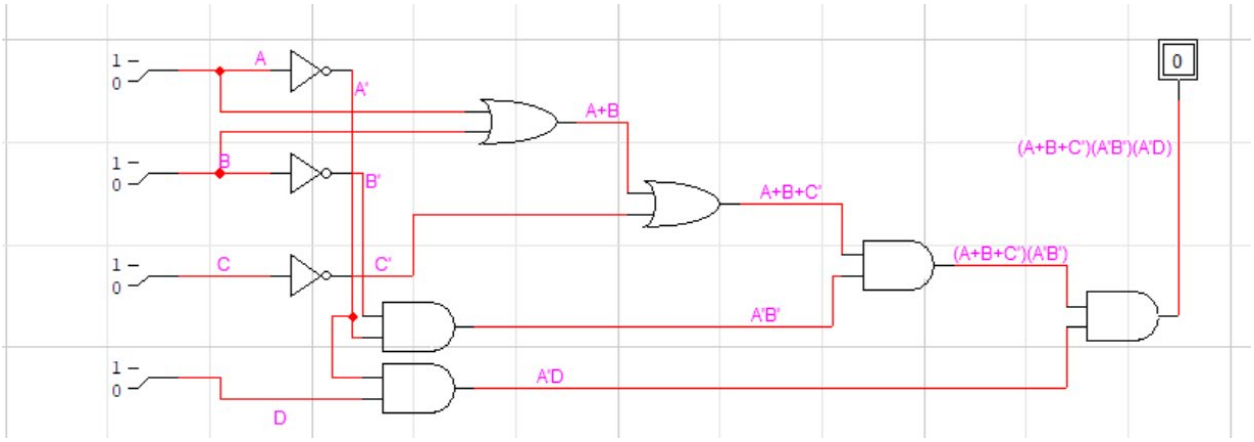
TRUTH TABLE (ACTUAL EXPRESSION):

A	B	C	D	A'	B'	C'	D'	A'+B'+ C+D	A'+B'+ C+D'	A+B+ C'+D'	A+B+ C'+D	A+B+ C+D	A+B+ C+D'	A+B'+ C'+D'	A+B'+ C+D'	RESULT (Using AND Gate)
0	0	0	0	1	1	1	0	1	1	1	1	0	0	1	1	0
0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0	0	1	0	1	1	0	0	1	1	0	0	1	1	1	1	0
0	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0
0	1	0	0	1	0	1	0	1	1	1	1	1	1	1	0	0
0	1	0	1	1	0	1	1	1	1	1	1	1	0	1	1	0
0	1	1	0	1	0	0	0	1	1	0	1	1	1	0	1	0
0	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0
1	0	0	0	0	1	1	0	1	1	1	1	0	1	1	1	0
1	0	0	1	0	1	1	1	1	1	1	0	1	1	1	1	0
1	0	1	0	0	1	0	0	1	1	1	1	0	1	1	1	0
1	0	1	1	0	1	0	1	1	1	1	1	1	0	1	1	0
1	1	0	0	0	0	1	0	0	0	1	1	1	1	1	1	0
1	1	0	1	0	0	1	1	1	1	1	0	1	1	1	1	0
1	1	1	0	0	0	0	0	1	1	1	1	1	0	1	1	0
1	1	1	1	0	0	0	1	1	1	1	1	0	1	1	1	0

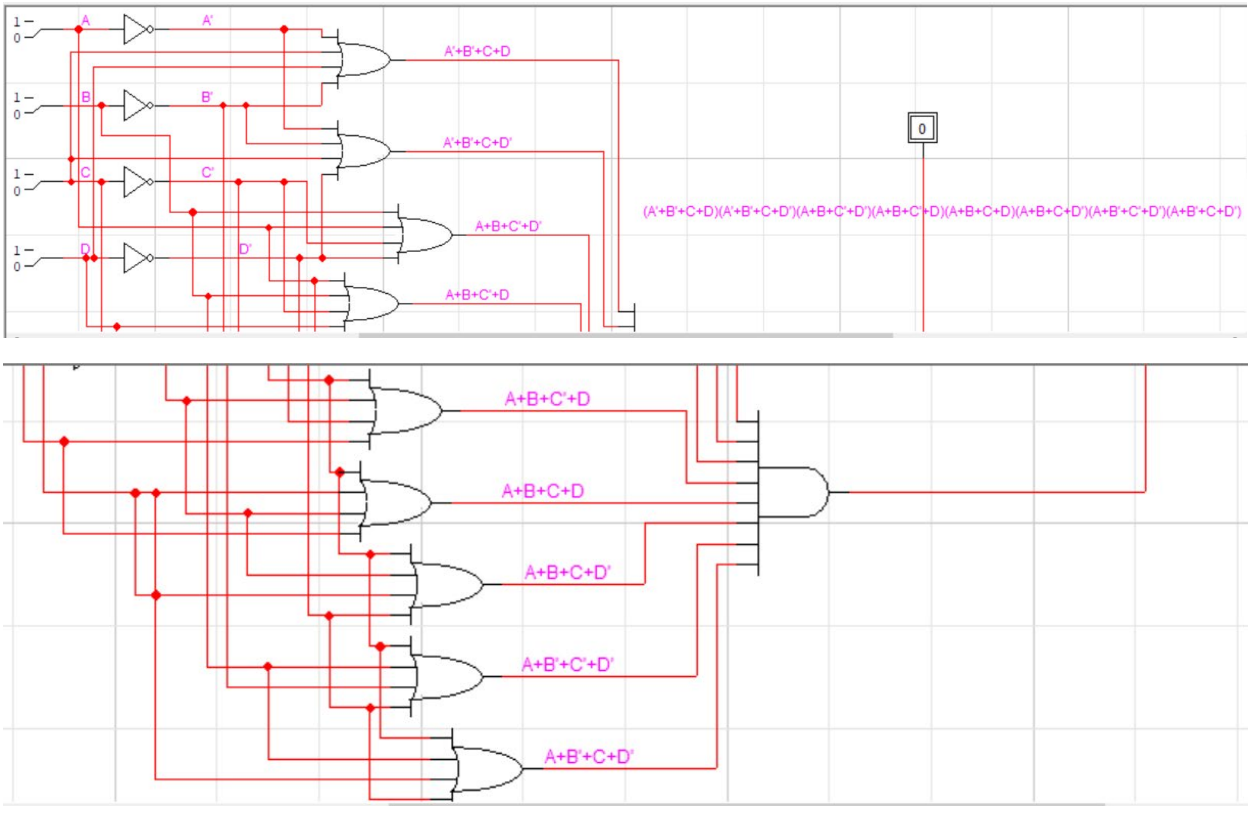
TRUTH TABLE (REDUCE EXPRESSION):

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

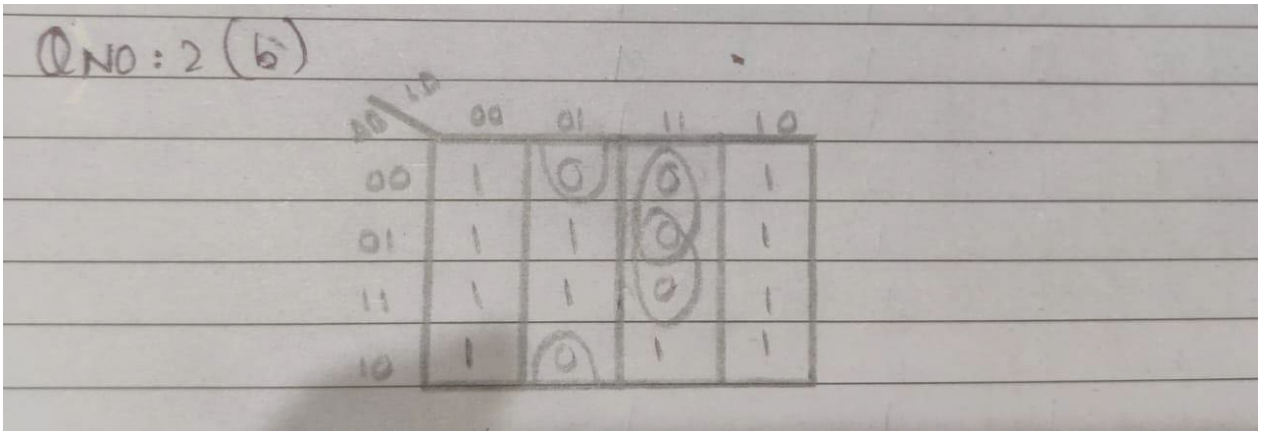
CIRCUIT FIGURE (REDUCE EXPRESSION):

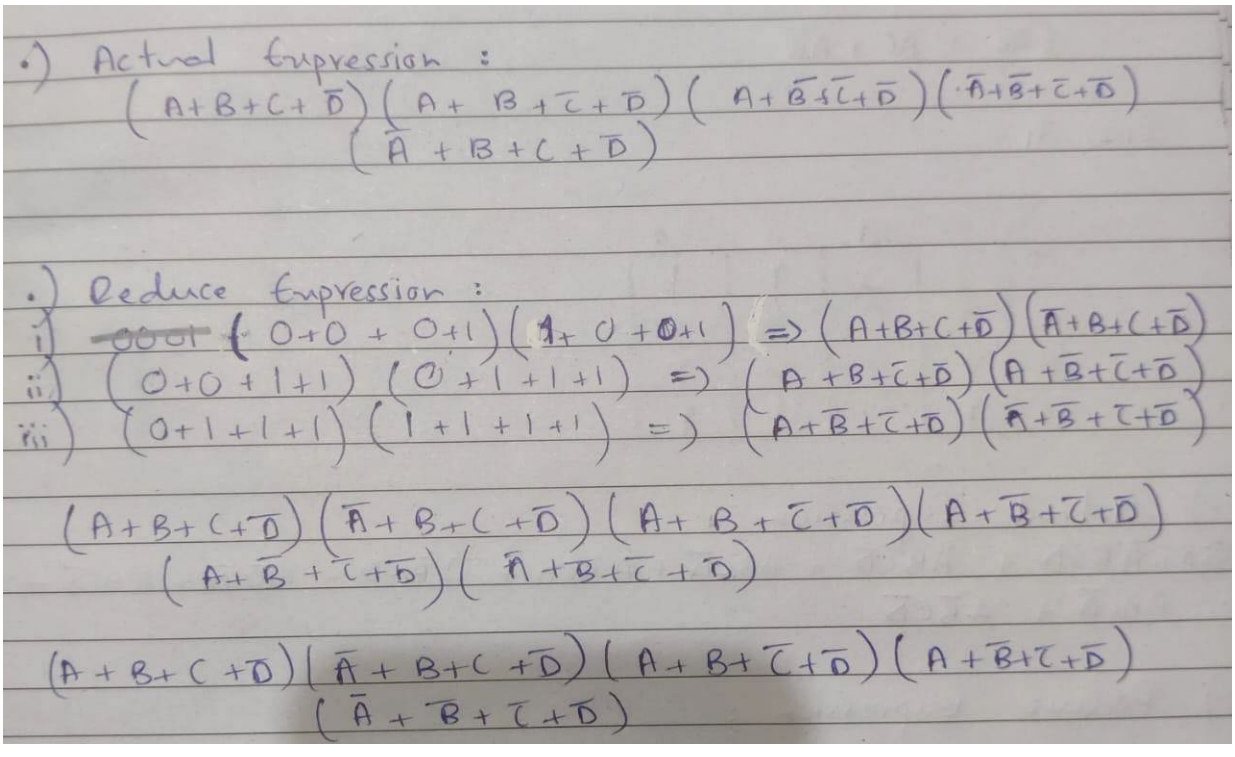


CIRCUIT FIGURE (ACTUAL EXPRESSION):



QUESTION:02(b)





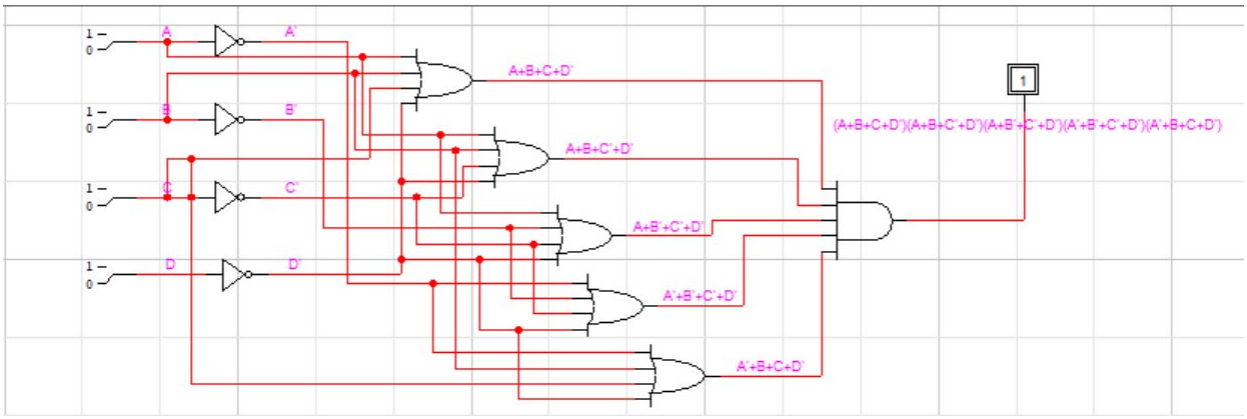
TRUTH TABLE (ACTUAL EXPRESSION):

A	B	C	D	A'	B'	C'	D'	A+B+ C+D'	A+B+ C'+D'	A+B'+ C'+D'	A'+B'+ C'+D'	A'+B+ C+D'	RESULT (Using AND Gate)
0	0	0	0	1	1	1	1	1	1	1	1	1	1
0	0	0	1	1	1	1	0	0	1	1	1	1	0
0	0	1	0	1	1	0	1	1	1	1	1	1	1
0	0	1	1	1	1	0	0	1	0	1	1	1	0
0	1	0	0	1	0	1	1	1	1	1	1	1	1
0	1	0	1	1	0	1	0	1	1	1	1	1	1
0	1	1	0	1	0	0	1	1	1	1	1	1	1
0	1	1	1	1	0	0	0	1	1	0	1	1	0
1	0	0	0	0	1	1	1	1	1	1	1	1	1
1	0	0	1	0	1	1	0	1	1	1	1	0	0
1	0	1	0	0	1	0	1	1	1	1	1	1	1
1	0	1	1	0	1	0	0	1	1	1	1	1	1
1	1	0	0	0	0	1	1	1	1	1	1	1	1
1	1	0	1	0	0	1	0	1	1	1	1	1	1
1	1	1	0	0	0	0	1	1	1	1	1	1	1
1	1	1	1	0	0	0	0	1	1	1	0	1	0

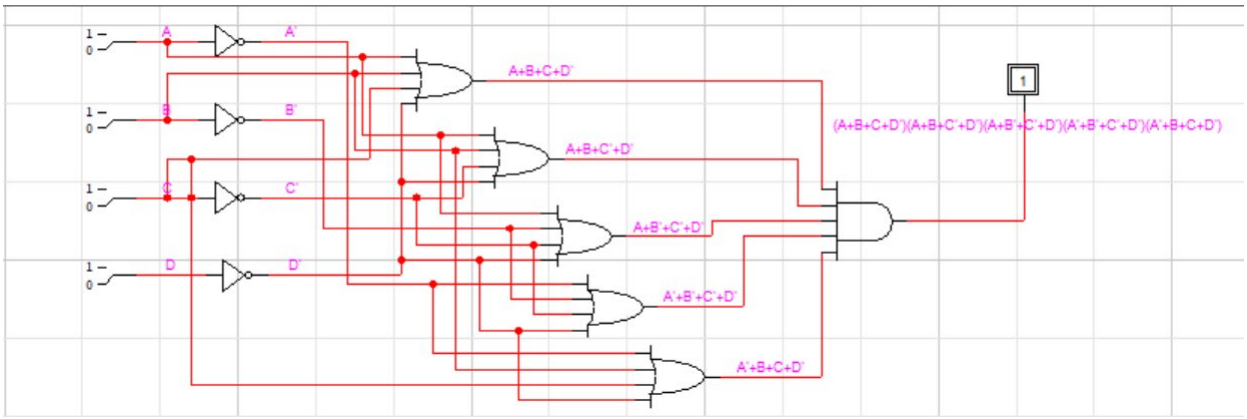
TRUTH TABLE (REDUCE EXPRESSION):

A	B	C	D	A'	B'	C'	D'	A+B+ C+D'	A+B+ C'+D'	A+B'+ C'+D'	A'+B'+ C'+D'	A'+B+ C+D'	RESULT (Using AND Gate)
0	0	0	0	1	1	1	1	1	1	1	1	1	1
0	0	0	1	1	1	1	0	0	1	1	1	1	0
0	0	1	0	1	1	0	1	1	1	1	1	1	1
0	0	1	1	1	1	0	0	1	0	1	1	1	0
0	1	0	0	1	0	1	1	1	1	1	1	1	1
0	1	0	1	1	0	1	0	1	1	1	1	1	1
0	1	1	0	1	0	0	1	1	1	1	1	1	1
0	1	1	1	1	0	0	0	1	1	0	1	1	0
1	0	0	0	0	1	1	1	1	1	1	1	1	1
1	0	0	1	0	1	1	0	1	1	1	1	0	0
1	0	1	0	0	1	0	1	1	1	1	1	1	1
1	0	1	1	0	1	0	0	1	1	1	1	1	1
1	1	0	0	0	0	1	1	1	1	1	1	1	1
1	1	0	1	0	0	1	0	1	1	1	1	1	1
1	1	1	0	0	0	0	1	1	1	1	1	1	1
1	1	1	1	0	0	0	0	1	1	1	0	1	0

CIRCUIT FIGURE (ACTUAL EXPRESSION):

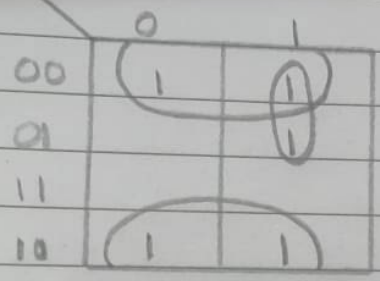


CIRCUIT FIGURE (REDUCE EXPRESSION):



QUESTION:03

Q NO : 3



.) Actual Expression :

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

.) Reduce Expression :

i) $000 + 001 + 100 + 101 \Rightarrow \cancel{A}\bar{B}\cancel{C} + \cancel{A}\bar{B}C + \cancel{A}\bar{B}\cancel{C} + \cancel{A}\bar{B}C$

$\Rightarrow B'$

ii) $001 + 011 \Rightarrow \bar{A}\cancel{B}C + \bar{A}\cancel{B}C \Rightarrow A'C$

$B' + A'C$

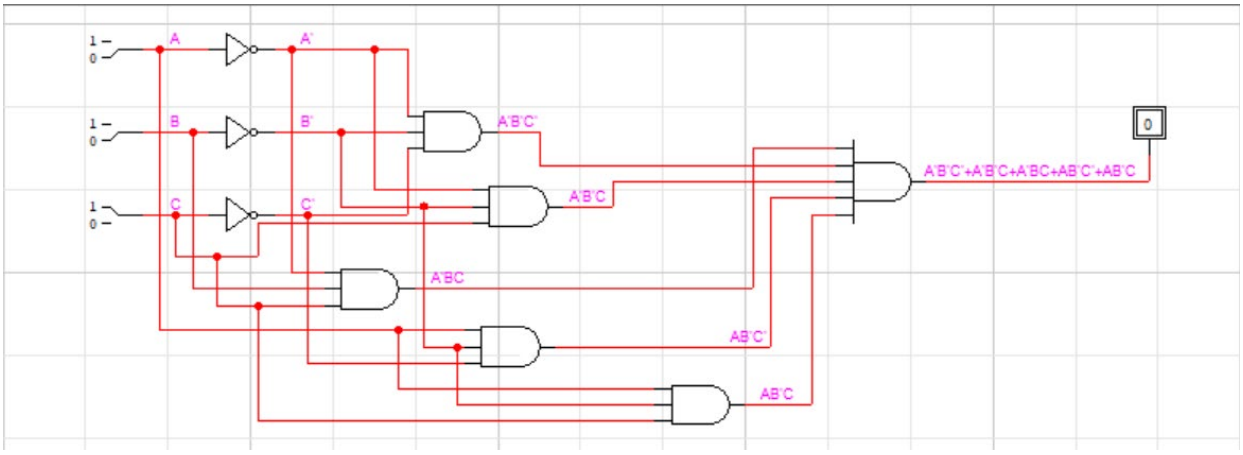
TRUTH TABLE (ACTUAL EXPRESSION):

A	B	C	A’	B’	C’	A’B’C’	A’B’C	A’BC	AB’C’	AB’C	A’B’C’+A’B’C+A’BC+AB’C’+AB’C
0	0	0	1	1	1	1	0	0	0	0	1
0	0	1	1	1	0	0	1	0	0	0	1
0	1	0	1	0	1	0	0	0	0	0	0
0	1	1	1	0	0	0	0	1	0	0	1
1	0	0	0	1	1	0	0	0	1	0	1
1	0	1	0	1	0	0	0	0	0	1	1
1	1	0	0	0	1	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0	0

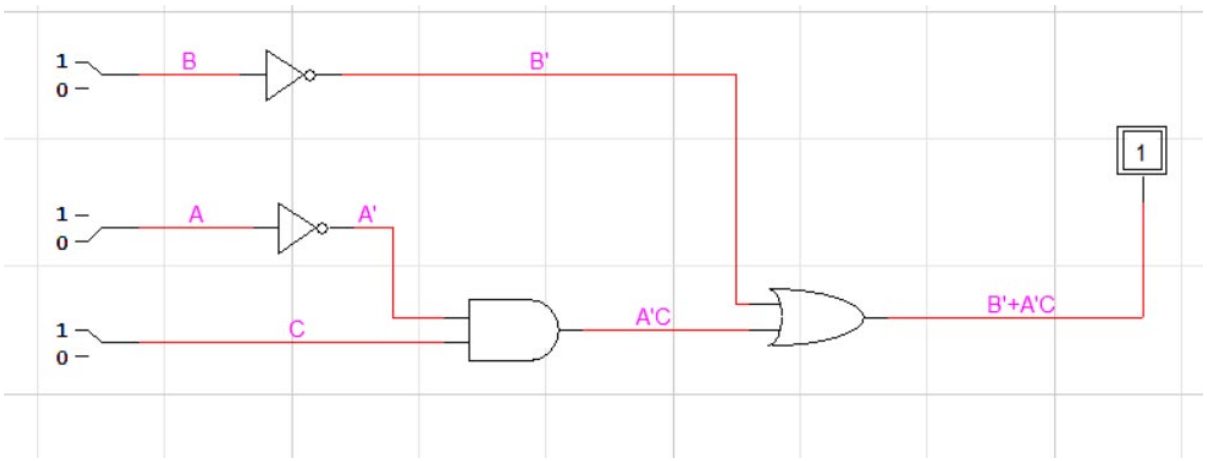
TRUTH TABLE (REDUCE EXPRESSION):

A	B	C	A’	B’	A’C	B’+A’C
0	0	0	1	1	0	1
0	0	1	1	1	1	1
0	1	0	1	0	0	0
0	1	1	1	0	1	1
1	0	0	0	1	0	1
1	0	1	0	1	0	1
1	1	0	0	0	0	0
1	1	1	0	0	0	0

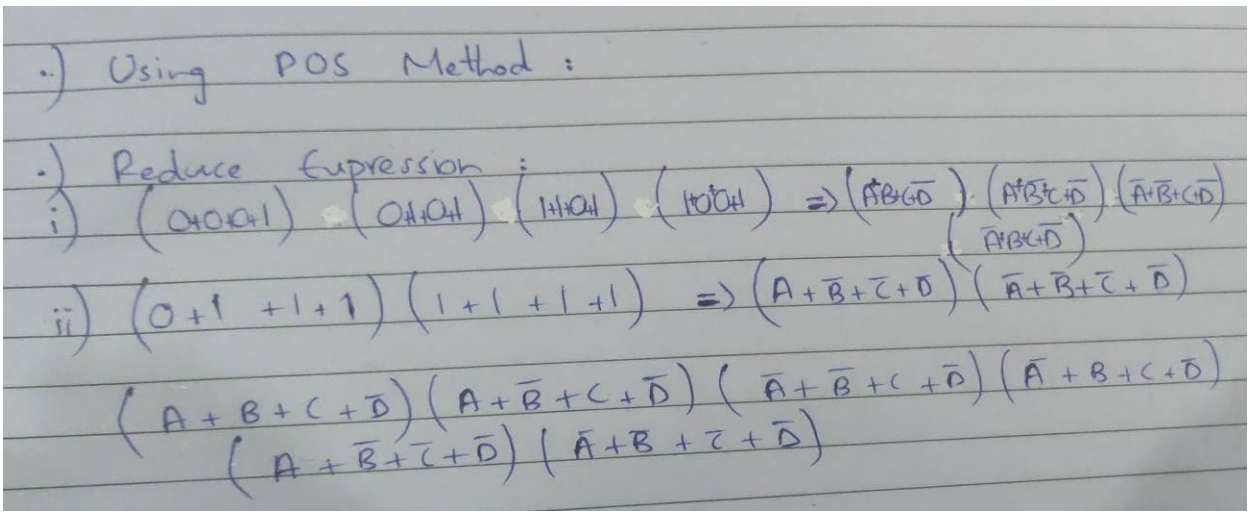
CIRCUIT FIGURE (ACTUAL EXPRESSION):

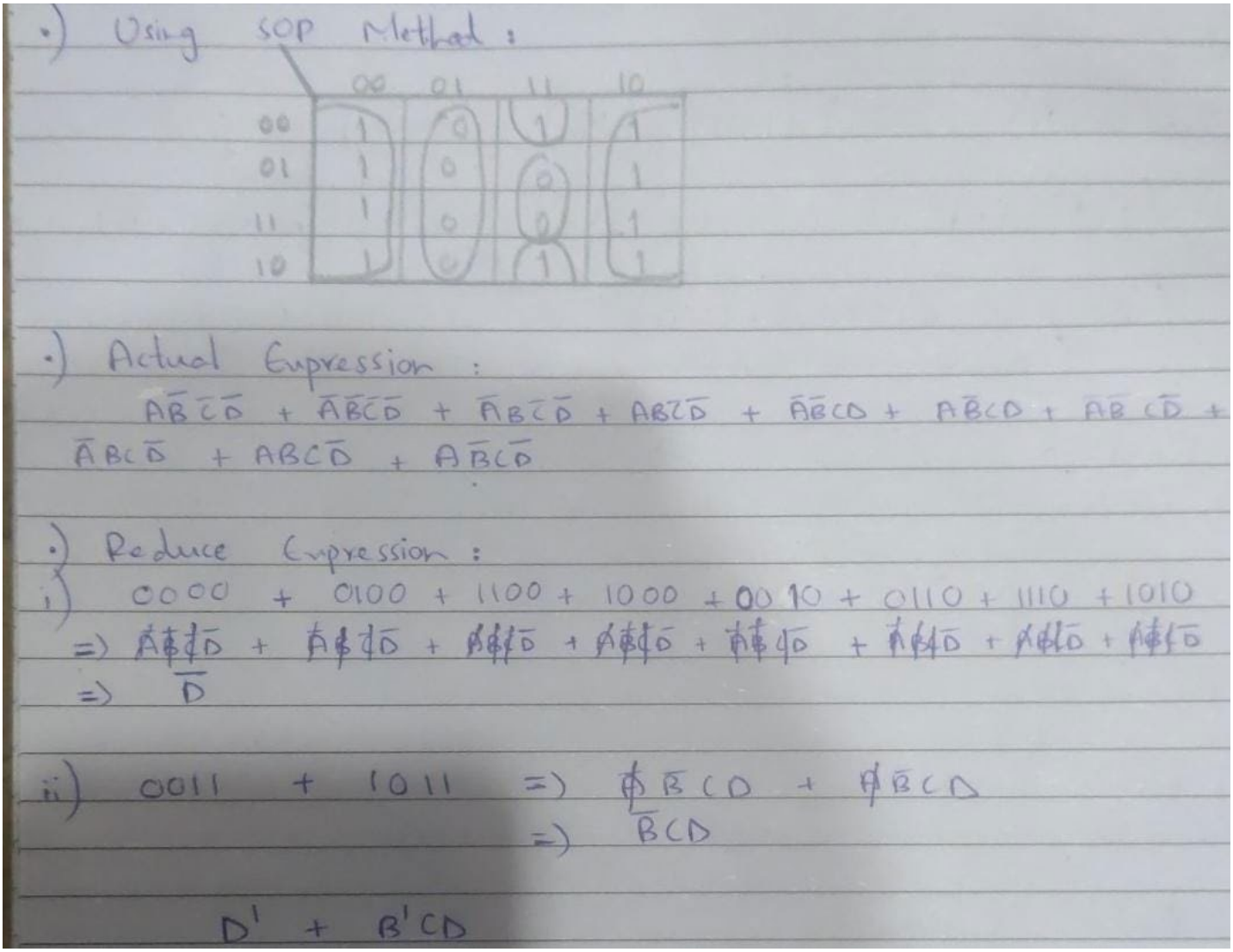


CIRCUIT FIGURE (REDUCE EXPRESSION):

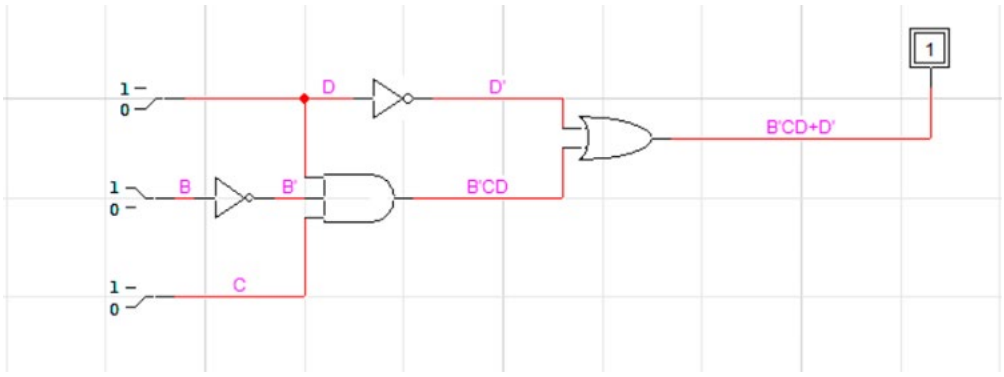


QUESTION:04

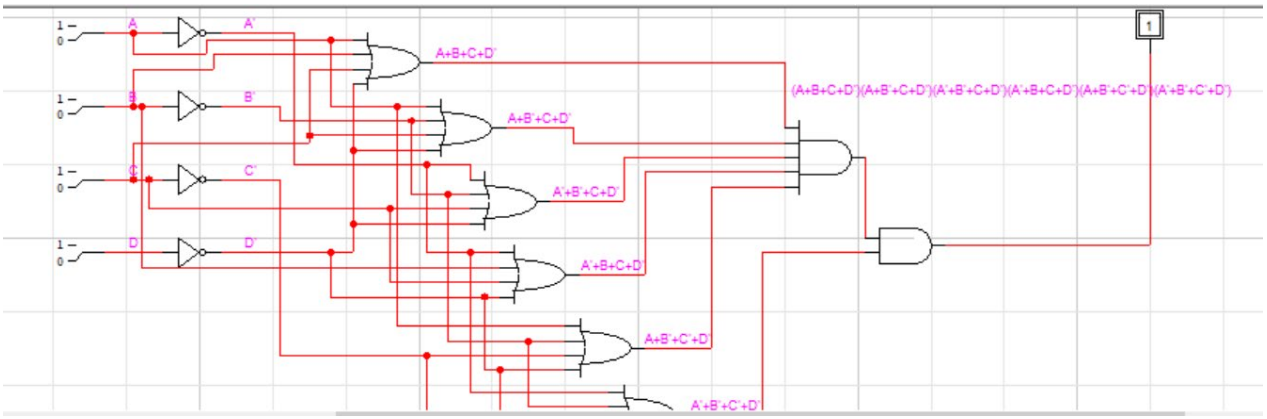




CIRCUIT FIGURE (REDUCE EXPRESSION OF SOP):



CIRCUIT FIGURE (REDUCE EXPRESSION OF POS):



TRUTH TABLE (REDUCE EXPRESSION OF POS):

A	B	C	D	A'	B'	C'	D'	A+B+ C+D'	A+B'+ C+D'	A'+B'+ C+D'	A'+B+ C+D'	A+B'+ C'+D'	A'+B'+ C'+D'	RESULT (Using AND Gate)
0	0	0	0	1	1	1	1	1	1	1	1	1	1	1
0	0	0	1	1	1	1	0	0	1	1	1	1	1	0
0	0	1	0	1	1	0	1	1	1	1	1	1	1	1
0	0	1	1	1	1	0	0	1	1	1	1	1	1	1
0	1	0	0	1	0	1	1	1	1	1	1	1	1	1
0	1	0	1	1	0	1	0	1	0	1	1	1	1	0
0	1	1	0	1	0	0	1	1	1	1	1	1	1	1
0	1	1	1	1	0	0	0	1	1	1	1	0	1	0
1	0	0	0	0	1	1	1	1	1	1	1	1	1	1
1	0	0	1	0	1	1	0	1	1	1	0	1	1	0
1	0	1	0	0	1	0	1	1	1	1	1	1	1	1
1	0	1	1	0	1	0	0	1	1	1	1	1	1	1
1	1	0	0	0	0	1	1	1	1	1	1	1	1	1
1	1	0	1	0	0	1	0	1	1	0	1	1	1	0
1	1	1	0	0	0	0	1	1	1	1	1	1	1	1
1	1	1	1	0	0	0	0	1	1	1	1	1	0	0

TRUTH TABLE (REDUCE EXPRESSION OF SOP):

B	C	D	B’	C’	D’	B’CD	B’CD+D’
0	0	1	1	1	0	0	0
0	0	0	1	1	1	0	1
0	1	1	1	0	0	1	1
0	1	0	1	0	1	0	1
1	0	1	0	1	0	0	0
1	0	0	0	1	1	0	1
1	1	1	0	0	0	0	0
1	1	0	0	0	1	0	0