AROR UNIVERSITY
OF ART, ARCHITECTURE,
DESIGN & HERITAGE,
SUKKUR, SINDH

Faculty of Artificial Intelligence & Multimedia Gamming

BS – Artificial Intelligence (Section A)

Digital Logic Design Lab

Lab # 05:

Mr. Abdul Ghafoor

Submission Profile

Name: Submission date (dd/mm/yy):

Marks obtained:

Comments:

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Instructor

Task 01: Sum of Product (SOP)

A. Construct a digital circuits of the given Boolean expression in Multisim, which is presented in a non-standard Sum of Product (SOP) format.
    1. AB’+B’+A’C+C
    2. AB’C’+CB’+A’C’
    3. A’+B’+AC’
    4. AB’+AC’+ABC’

Add snapshot of circuits of above expressions

1	
2	
3	

4	

B. Convert the non-standard SOP expression from A into the standard SOP format and then build its digital circuit representation as a standard SOP Boolean expression in Multisim.

Note: use the pen paper to convert the non-standard SOP to Standard SOP, add the snapshot of the solutions below

1	
2	

3	
4	

Add snapshot of circuits of above standard SOP expressions

1	
2	
3	
4	

C. Fill the following truth table for output of the both standard SOP and standard SOP circuits.

AB+B'+AC+C

A	B	C	Output of Non-Standard SOP	Output Standard SOP
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

A'BC'+AB'+AC'

A	B	C	Output of Non-Standard SOP	Output Standard SOP
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

A+B+C

A	B	C	Output of Non-Standard SOP	Output Standard SOP
0	0	0		
0	0	1		
0	1	0		
0	1	1		

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

AB+AC+BC'

A	B	C	Output of Non-Standard SOP	Output Standard SOP
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

Task 02: Product of Sum (POS)

A. Construct a digital circuits of the given Boolean expression in Multisim, which is presented in a non-standard Product of Sum (POS) format.
   1. (A'+B') . (A'+ B' + C).(A + C)
   2. (B' +C) . (B' + C) . (A + B' + C')
   3. (A' . (A' + B)

Add snapshot of circuits of above POS expressions

1	

2	
3	

B. Convert the non-standard POS expression from A into the standard POS format and then build its digital circuit representation as a standard POS Boolean expression in Multisim.

Note: use the pen paper to convert the non-standard POS to Standard POS, add the snapshot of the solutions below

1	

2	
3	

Add snapshot of circuits of above standard POS expressions

1	
2	
3	

C. Fill the following truth table for output of the both standard POS and standard POS circuits.

(A+B) . (A'+C).(A+B+C)

A	B	C	Output of Non-Standard POS	Output Standard POS
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

(B+C) . (B' + C) . (A' + B' + C')

A	B	C	Output of Non-Standard POS	Output Standard POS
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

(A) . (A' + B')

A	B	C	Output of Non-Standard POS	Output Standard POS
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		