LAB MANUAL

**Max terms and minterms:**

**Q1-Find Max terms from the following Min terms**

**(i) F(X,Y,Z) =Σm(1,3,6,7)**

Answer: F’(X,Y,Z)=πM(0,2,4,5)

**(ii) F(X,Y,Z) =Σm(0,1,2,4,6)**

Answer: F’(X,Y,Z)=πM(3,5,7)

**(iii) F(A,B,C) =Σm(0,3,4,5,7)**

Answer: F’(A,B,C)=πM(1,2,6)

**Q2:For the Boolean function F1(A, B, C) = ∑ m(0,2,3,4,6) do the following:**

**a) Find truth table**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  | | --- | --- | --- | --- | | A | B | C | F | | 0 | 0 | 0 | 1 | | 0 | 0 | 1 | 0 | | 0 | 1 | 0 | 1 | | 0 | 1 | 1 | 1 | | 1 | 0 | 0 | 1 | | 1 | 0 | 1 | 0 | | 1 | 1 | 0 | 1 | | 1 | 1 | 1 | 0 | |

|  |
| --- |
| **b) Find minimal SOP expression for Boolean function F1 and implement it on logic works.** |

|  |
| --- |
| F=A’B’C’+A’BC’+A’BC+AB’C’+ABC’ |

**Q3:For the Boolean function F1(A,B,C,D) = ∑ m(0,2,4,6,7,8,10,12,14,15) do the following:**

**a) Find truth table**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  | | --- | --- | --- | --- | | A | B | C | F1 | | 0 | 0 | 0 | 1 | | 0 | 0 | 0 | 0 | | 0 | 0 | 1 | 1 | | 0 | 0 | 1 | 0 | | 0 | 1 | 0 | 1 | | 0 | 1 | 0 | 0 | | 0 | 1 | 1 | 1 | | 0 | 1 | 1 | 1 | | 1 | 0 | 0 | 1 | | 1 | 0 | 0 | 0 | | 1 | 0 | 1 | 1 | | 1 | 0 | 1 | 0 | | 1 | 1 | 0 | 1 | | 1 | 1 | 0 | 0 | | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | |

**b) Find minimal SOP expression for Boolean function F1 and implement it on logic works.**

|  |
| --- |
| F1=A’B’C’D+A’B’CD’+A’BC’D’+A’BCD’+A’BCD+AB’C’D+AB’CD’+ABC’D’+ABCD’+ABCD |

**POS**

**Q4- Convert the following to POS form by using the distributive law**

**xy' + yz'**

-By distributive law:

=( xy') + y . z'

=(x’+y)(y’+z)

**Q5- Convert the following to POS form by using the De Morgan laws**

**b′d+ac′d′**

-By de-morgans law:

=b’d+ac’d’

=(b+d’)(a’+c+d)

**SOP**

**Q6-Write the following in SOP form**

**a. (x'+y)(y'+z)**

=x’y’+y’z+yy’+yz

=x’y’+x’z+yz

**b. (x + y’)(y’+ z)**

=xy’+xz+y’y’+y’z

=xy’+xz+y’+y’z

=xy’+xz+y’

=xz+y’

**Q7-For the Boolean functions implement the circuit on Logic Works. Make a truth table F2 = [(A+BC’)(A’C’)]’+ C**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A | B | C | A’ | C’ | BC | A+BC | A’C’ | (A+BC)(A’C’) | F |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 |
| 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |

**Circuit:**

