Unit III - Combinational Logic Circuits

Part – B

1. Determine the sum of product for the following Boolean expression using quine McCluskey method. F (A,B,C,D) = ∑ m (2,6,8,9,10,11,14,15)
2. Determine the sum of product for the following Boolean expression using quine McCluskey method. F (A,B,C,D) = ∑ m (1,7,9,10,12,13,15) +d (0,2,4)
3. Implement the following Boolean function using an 8:1 multiplexer considering D as the input and A,B,C as selection lines : F(A, B, C, D) = AB'+BD+B'CD'
4. Design a full adder using 4X1 multiplexer; also write its truth table and logical diagram.
5. Implement the following function using 8:1 MUX
   $\boldsymbol{f(A,B,C,D) = \sum_m(0,2,4,6,8,10,12,14)}$
6. Explain the 8:1 MUX
7. Implement the following Boolean function with the help of 4:1 Mux.
   f(A,B,C,D) = Σm (1,2,4,7,11,13,15).
8. Implement the following Boolean function using 8:1 Mux:
   F(A,B,C,D)=Σm(0,1,3,4,8,9,15)
9. Explain 1:8 De MUX
10. Discuss the working of 3 to 8 line binary decoder with truth table, equations and neat circuit diagram.
11. Discuss the working of 8 to 3 line binary encoder with truth table, equations and neat circuit diagram.
12. Implement the full subtractor with the help of 2:4 decoder.
13. Design a 2 bit magnitude comparator using gates
14. Discuss about the purpose of decoder and Implement a full adder and full subtractor using decoder.
15. Discuss about the design of 4-bit BCD adder with neat diagram and mention how many adders are used in the BCD circuit.
16. With necessary diagrams, explain in detail about the working of a 4-bit look ahead carry adder. Also mention its advantages over conventional adder.
17. Design the Logic diagram of 2-bit magnitude comparator with relevant truth table and K Map reduction.
18. Discuss the working of 8 to 3 line binary encoder with truth table, equations and neat circuit diagram.