Sardar Vallabhbhai Patel Institute of Technology, Vasad

Digital Fundamentals

Assignment 4

Combinational Logic

1. Compare: Combinational Circuit – Sequential Circuit
2. What's half Adder? What's disadvantage of it over full adder?
3. With necessary sketch explain full adder in detail. Also Explain a full adder can be designed using two half adders and a OR gate
4. Design Half Subtractor using NAND gate only.
5. Design a circuit of 4-bit input binary which indicates if the four bit input is BCD or not. If it's BCD, then output must be high.
6. Design a combinational circuit that generates the 9's complement of a BCD digit
7. Design a combinational circuit whose input is four bit binary number and output is the 2's complement of the input binary number.
8. Design a combinational circuit that accepts a three bit binary number and generates an output binary number equal to the square of the input number
9. Construct a logic circuit that gives output four times of two bit binary variable input.
10. Design a Logic Circuit which has 4 bit binary input and it provides output logic 1 when input logic 1 is in odd number.
11. Two sensors are set up to measure traffic intensity on road. One sensor (A) is for measuring traffic intensity of higher level, where other sensor (B) is for measuring traffic intensity of lower level. If traffic is below the mark, Green LED glows. If traffic is above the mark, Red LED glows and if traffic is between them, Yellow LED glows. For any fault measurement, a buzzer is connected. Design Logic circuit for the system considering sensors as input.
12. Design a 4 bit binary to BCD code converter
13. Design logic circuit for BCD to Gray code conversion for four bits input
14. Design the Combinational Circuits for Binary to Gray Code Conversion for four bits input
15. Design BCD to Excess-3 code converter using minimum number of NAND gates
16. Design a four bit binary to 5421 code converter logic circuit.
17. Design a three bit ex-3 to binary code converter circuit using NOR gates only.
18. Design a logic circuit for four bit inputs which provides output high if input is greater than 3.