

DCS QUESTION SET NO 2

Ques 1: Design FULL ADDER using two HALF ADDER? Write its truth table also?

Ques 2: Design FULL SUBTRACTOR using two HALF SUBTRACTOR? Write its truth table also?

Ques 3: Design a combinational circuit with three inputs X, Y and Z & three outputs A, B and C. When the binary input is 0, 1, 2 or 3, the binary outputs is one greater than the input. When the binary input is 4, 5, 6 or 7, the binary output is one less than input?

Ques 4: You are presented with a set of requirements under which an insurance policy can be issued. The applicant must be:

- 1) a married female 25 years old or over , or
- 2) a female under 25 , or
- 3) a married male under 25 who has not been involved in a car accident , or
- 4) a married male under 25 who has been involved in a car accident, or
- 5) a married male 25 year or over who has not been involved in a car accident.

Find an algebraic expression which assumes a value 1 whenever the policy is issued. Simplify the expression obtained.

Ques 5: In an application 4 inputs A, B, C, D are available in true and complement Form .These are fed at a logic circuit which operates a relay. The relay is ON for ABCD = 0000, 0010, 0101, 0110, 1101 and 1110. The states 1000 and 1001 don't occur. For remaining states the relay is OFF.

- a) prepare truth table and minimize outputs F using K map
- b) Realize F using 3 input NAND gates.

Ques 6: A circuit receives a 4- bit excess -3 code. Design a minimal circuit to detect the decimal number 0, 1 ,4, 7 and 8?

Ques 7: Design and implement 4- bit gray to binary converter?

Ques 8: Design and implement SOP circuit that will generate an odd parity bit for a 4- bit input?

Ques 9: Design 4- bit magnitude comparator? What is the function of cascading inputs in magnitude comparator? How are they connected?

Ques 10: A one bit full adder is to be implemented using 8:1 MUX

- a) Write truth table for SUM(S) and Carry (C) in terms of two bits A and B and carry from previous stage.
- b) Implement S and c using 8:1 MUX.