S.V.NATIONAL INSTITUTE OF TECHNOLOGY, SURAT
B. Tech. II (EC) 3rd sem

SUBJECT: Digital Logic Design (EC203)

Mid Test (Sept -2014)

Time: 1 hour   **Total Marks: 30**

Q.1 (a) Convert gray number 10110010 into decimal, BCD, 84-2-1 and EX_3 codes.   02

(b) Consider 10 bit register is used to store the numbers. Perform subtraction of - 257 – 169 using sign 1's complement method.   02

(c) Perform subtraction of $(342.7)_{10} - (108.9)_{10}$ in BCD code using 10's complement method.   03

(d) $(12)_x + (81)_x = (77)_x$ then find its radix x.   01

Q 2 (a) Convert SR flip-flop into T flip-flop.   02

(b) A sequential circuit has one input x and its state diagram is shown in figure.1. Design the sequential circuit using positive edge trigger JK flipflops.   04
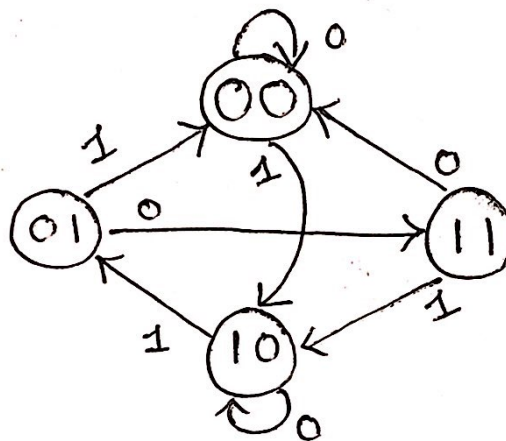
Fig. 1

(c) Consider Boolean function $F(A,B,C,D)=\sum m(2,8,9,13,14)$. It's simplified SOP is B'D'+CD'+AC'D . Are there any don't care numbers? If so what are they numbers?   02

OR

(c) For the logic circuit shown in figure 2, what is the required input condition to make the output 1?   02
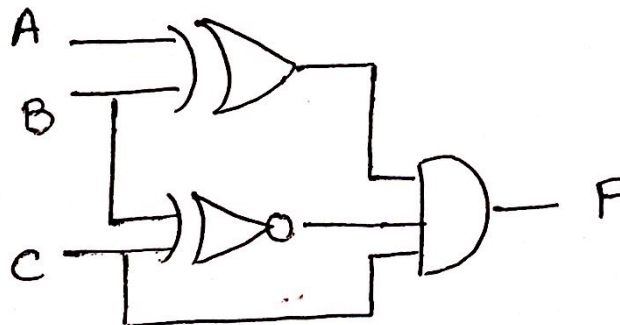
Fig. 2

Q 3 (a) Design single bit magnitude comparator using only 2 input NAND gates. **04**

(b) Design a circuit with three inputs A,B ,C and two outputs X and Y. The output **04**
X is HIGH if and only if total number of 1 in input are odd. The output Y is
HIGH whenever at least two inputs are 1. Write down truth table. Find
simplified circuit diagram.

(c) For the following figure 3 find **03**
   i)   Boolean expression for Y
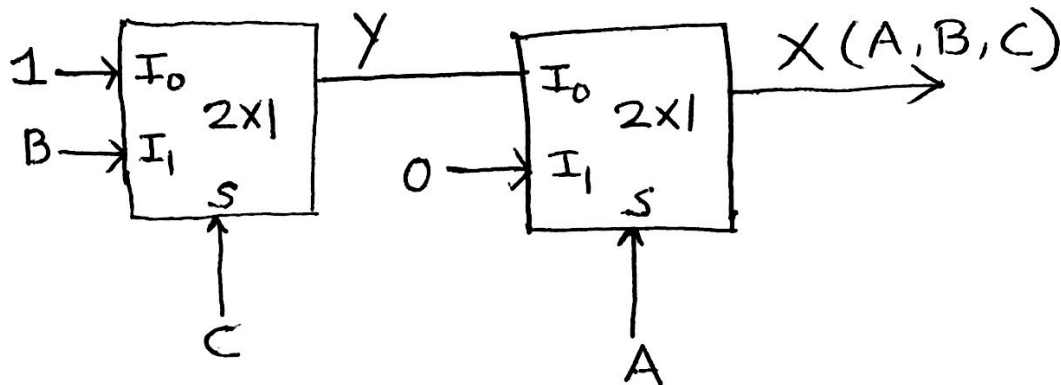   ii) Boolean expression for X and sum of minterms for X(A,B,C).

fig : 3

(d) For the following figure 4 find HIGH/LOW for I_0, I_1 and Y if EWXYZ=10010, **03**
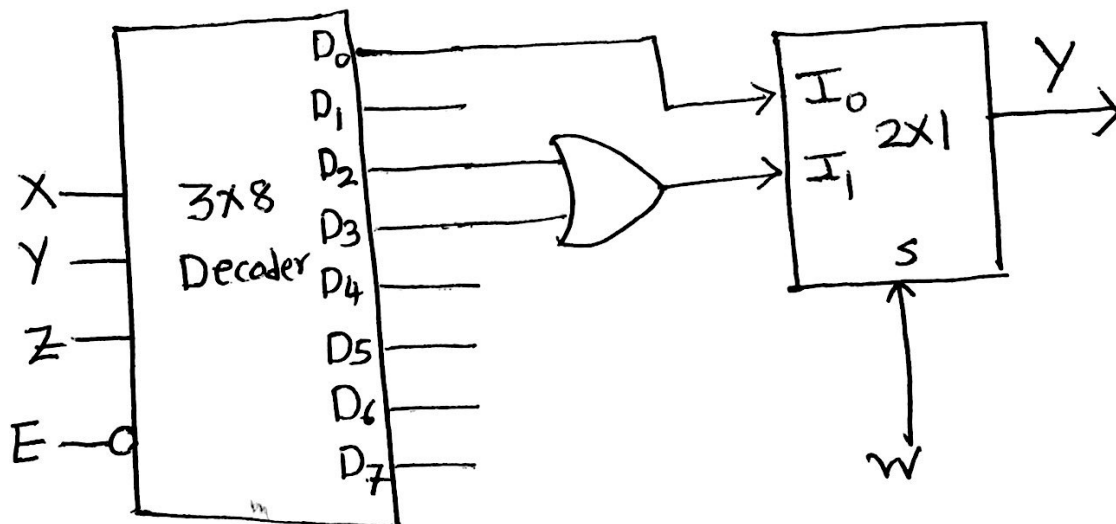00011, 01011.

fig : 4

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