INDRAPRASTHA INSTITUTE OF INFORMATION TECHNOLOGY, DELHI

ECE111 DC

TUTORIAL 5 (20 marks)

Q1) Consider the following Boolean expressions:

i. $F(a,b,c,d) = a\,c + b\,c + a'b\,c\,d + a'b'\,c + b\,d + b'c'd'$

ii. $F(a,b,c,d) = a'b'c\,d' + ab'cd + ab'cd + abcd$

Write the complete set of essential prime implicants. (2 marks)

Q2) Perform Subtraction using r's complement

i. $(FA50)_{16}$ - $(FBCD)_{16}$

ii. $(7053)_{13}$ - $(9756)_{13}$

iii. $(11011011)_2$ – $(11110001)_2$

iv. $(7564)_8$ – $(7664)_8$

(4 marks)

Q3) Convert the given binary coded decimal (BCD) to Excess-3 and Gray Code.

i. 01011001

ii. 10010011

(2 marks)

Q4. (a) What will be the BCD code and Excess 3 code equivalent of decimal number 6248?

(2 marks)

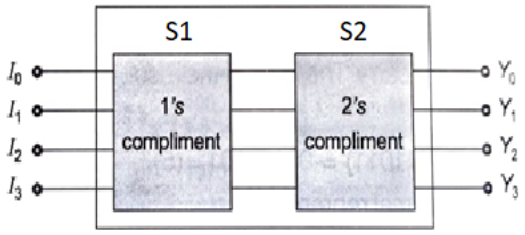
(b) Convert:

i. $(10010)_2$ to gray code

ii. $(11011)_{Gray}$ to Binary code

(2 marks)

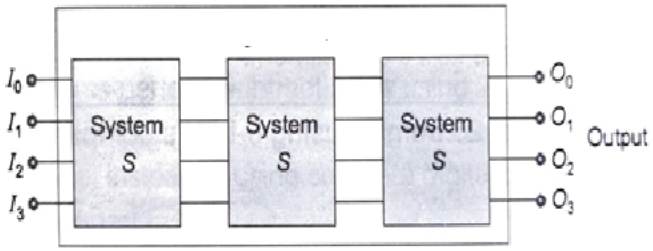
Q5. Consider a System *S* as shown in the figure below:



System S

System *S* performs 1's compliment of the inputs $I_3I_2I_1I_0$. The output of 1's complement is then 2's complimented to produce outputs $Y_3Y_2Y_1Y_0$.

A new System *H* is designed in which three units of System *S* are cascaded.



System H

For the following inputs ($I_3I_2I_1I_0$), find the outputs($O_3O_2O_1O_0$).

i. 1010

ii. 0001

iii. 1111

iv. 1001

(8 marks)

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