Printed Pages : 3 | 926 | EC302(MTU

(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID :131312 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. III) THEORY EXAMINATION, 2015-16

DIGITAL DESIGN

[Time : 3 hours] [Total Marks : 100]

SECTION - A

1. Attempt **all** parts. All prats carry **equal** marks. Write answer of each part in short. (2x10=20)

   (a) Perform the Subtraction using 2's complement 23-46.

   (b) Simplify the following Boolean expression:

   $$(AB+AC)'+A'B'C$$

   (c) Design a Half Adder using NAND gates only.

   (d) How many flip flops are required to design a Mod 59 Binary Counter.

   (e) Differentiate betweem Synchronous and Asynchronous sequential circuits.

(f) Construct basic SRAM memory Cell.

(g) How many address lines and data input/ output lines are required for a 64K X 12 memory?

(h) Design a Half Adder using Multiplexer.

(i) Design a divide by 4 Asynchronous counter using JK Flip Flop.

(j) How many Flip Flops are required for Mod-10 counter?

SECTION - B

Attempt **any five** questions from this section. (10x5=50)

2. Minimize the following using Tabular method:

$$f(A,B,C,D) = \sum m(4, 5, 6, 8, 9, 10, 13) + \sum d(0, 7, 15)$$

3. Obtain Hamming codeword for the given data: "11001001010". Use even parity.

4. Convert the decimal number 42.50 in Octal, Hexadecimal, Gray, 8421, Excess-3.

5. Design a 4-bit by 4-bit Binary Multiplier.

6. Realize the following expression using 8:1 Multiplexer: F(A,B,C,D)=A'BC+B'C'D+A'C'

7. Design a 3- bit binary to Gray Code converter using PLA.

8. Draw and explain 4-bit Universal shift Register.

9. Design a 3-bit UP-DOWN counter.

SECTION - C

Attempt **any two** questions from this section. (15X2=30)

10. Obtain the reduced flow table for an Asynchronous sequential circuit that has two inputs x_2 and x_1 and one output z. When x_1=0, the output z=0. The first change in x_2 that occurs while x_1=1 will cause output z to be 1. The output z will remain 1 until x_1 returns to zero.

11. Design a Sequence Generator to generate the given sequence: "10100011".

12. Design a circuit for addition BCD numbers.

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