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Roll No. | | | | | | | | | | | | Total No. of Pages : 2

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B.Sc.(IT) (Sem.–2nd)

DIGITAL ELECTRONICS FUNDAMENTALS

Subject Code : BS-102

Paper ID : [B0405]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students has to attempt any FOUR questions.**

SECTION-A

l. Answer briefly :

i. Find the 2's complement of 10111000 using the alternative method.

ii. Convert the following binary number to hexadecimal.

1100101001010111

iii. Convert the following Boolean expression to sum of product form :

$\overline{\overline{(A+B)}+C}$.

iv. Prove that A(A+B) = A.

v. X = 1010100 Y = 1000011.

Find X – Y using 2's complement.

vi. What is the difference between sequential circuit and combinational circuit?

vii. Define D type flip flop and draw the truth table.

viii. Draw the block diagram of clocked SR flip flop with preset and clear logic.

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ix. Write the steps for transferring a new word to be stored into memory.

x. What is the difference between single error correction and double error correction?

SECTION-B

2. Explain ROM with its block diagram. Draw the Internal logic of 32*8 ROM and its truth table. 10

3. Construct a 16*1 multiplexer with two 8*1 and one 2*1 multiplexer using block diagram. 10

4. What is decoder? Draw block diagram of 3 to 8 line decoder with enable. 10

5. a) Simplify the Boolean function using K-Map.

   $F(w,x,y,z) = \sum (0,1,2,4,5,6,8,9,12,13,14)$ 5

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   b) Convert the expression $Y = (A+B)(A+C)(B+\overline{C})$ into standard Product of Sum (POS) Form. 5

6. a) Draw the block and circuit diagram of master slave JK flip flop. Explain the functionality and race around condition. 5

   b) Find the complement of the function :

   F1 = x'yz' + x'y'z and F2 = x(y'z' + yz) by using DeMorgan's theorem. 5

7. a) Explain the working of 4 bit universal shift register with diagram. 5

   b) Explain the 4 bit ring counter. Draw the block diagram and truth table. 5

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