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Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, October 2011
PT.10.104/ 08.305 : DIGITAL SYSTEM DESIGN (RF)
(2008 Scheme)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions.

1. What is meant by unweighted code ? Give an example.
2. Explain the two types of complements of a base-r number system.
3. Convert the following numbers of decimal equivalent :
   a) $(121210.1210)_3$ b) $(BCE.AC)_{15}$
   c) $(4321.4120)_5$ d) $(7543.017)_8$.
4. Differentiate between minterm form and maxterm form of a boolean function.
5. Explain the working of a 4×1 Multiplexer.
6. Draw the circuit diagram of a Full-Adder with 2-Half adders and an OR gate. Give the output expressions also.
7. Simplify the following boolean function as sum of products using k-map.
   $f(a, b, c, d) = \sum (0, 1, 2, 4, 5, 6)$
   $d = \sum (3, 7, 14, 15)$ (don't cares)
8. Explain the working of D-Flip-Flop ?
9. Differentiate between sequential and combinational circuits.
10. Write notes on universal shift registers.

(10×4=40 Marks)

P.T.O.

PART – B

Answer **any one** from **each** Module.

Module – I

11. Subtract the following numbers using both r's complement and (r–1)'s complement method of subtraction.

    i) $(10101.110)_2 - (1101.10)_2$

    ii) $(66)_8 - (675)_8$

    iii) $(ABC1.186)_{16} - (AB\ 7.75)_{16}$

    iv) $(9873.6)_{BCD} - (75.15)_{BCD}$. **20**

OR

12. a) Perform the following operations

    i) 1110.1101×110.11

    ii) $110110.110 / 101$

    iii) $11011.1010 - 10111.10$ (Using Direct Method)

    iv) $110110.0101 + 11010.1101$. **8**

    b) Explain the procedure for subtraction of two numbers using (r–1)'s complement method of addition. Give two examples. **12**

Module – II

13. a) Obtain the simplified expression in product of sum using k-map.

    $F(A, B, C, D) = \Pi\ (0, 1, 2, 3, 4, 10, 11)$. **5**

    b) Convert the following to the other canonical form.

    $F(A, B, C, D) = \Sigma\ (0, 2, 6, 11, 13, 14)$. **5**

    c) Design a 4-bit Magnitude Comparator. **10**

OR

14. a) Design a BCD-Decimal decoder. **10**

b) Simplify the following boolean function using Quine-McClusky Method.

$F(A, B, C, D, E) = B'DE' + A'BE + B'C'E' + A'BC'D'$

$d = BDE' + CD'E'$ **10**

[d $\rightarrow$ don't cares).

Module – III

15. Design a 4-bit up-down Binary Counter. **20**

OR

16. a) Explain the working of a Master-Slave JK-flipflop. **10**

b) Discuss the operation of a 4-bit shift register using D-flipflop. **10**
