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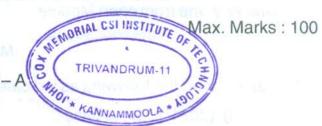
Third Semester B.Tech. Degree Examination, September 2014

(2008 Scheme)

(Special Supplementary)

08.305 : DIGITAL SYSTEM DESIGN (RF)

Time: 3 Hours



Answer all questions:

- Represent the decimal number 1875 in
 - a) BCD code
 - b) Excess-3 code
 - c) As hexadecimal
 - d) As octal.
- 2. Determine the radix 'r':
 - i) $(365)_r = (194)_{10}$
 - ii) $(BEE)_r = (2699)_{10}$.
- 3. What are self complementing codes? Give an example.
- 4. Show that:
 - a) a + a'b = a + b
 - b) x'y'z + x'yz + xy' = x'z + xy'
- 5. A circuit receives a 4-bit Excess-3 code. Design a minimal circuit to detect the decimal numbers 0, 1, 4, 6, 7 and 8.
- 6. Implement the following function

F = AB'CD' + A'BCD' + AB'C'D + A'BC'D with exclusive-OR and AND gates.

7. Differentiate between a decoder and a demultiplexer.



- 8. What do you mean by race condition in a flip-flop? How can it be eliminated?
- 9. What is the difference between serial and parallel transfer? What type of register is used in each case?
- 10. Explain the principle of a shift register.

(10×4=40 Marks)

PART-B

Answer any one from each Module.

Module - I

- 11. a) Convert the following as indicated:
 - i) (2021.102)3 to base 9
 - ii) (ADE.B)₁₆ to base 4
 - iii) (134.12)₅ to base 7
 - iv) (384.74)₁₀ to binary
 - v) (756.603)₈ to hexadecimal.

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b) Differentiate between a weighted and an unweighted code. Give examples for each.

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OR

- 12. a) Perform the arithmetic operations:
 - a) 10111.101 + 110111.01 as evid V 29bag guilas
 - b) 10001.01 1111.11
 - c) 1101.11 × 101.1
 - d) 10111110 ÷ 1001

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b) Explain briefly on error detection and error correction codes.

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Module - II

- 13. a) Express the following functions in a sum of minterms and a product of maxterms:
 - i) F(A, B, C, D) = D(A' + B) + B'D
 - ii) F(w, x, y, z) = y'z + wxy' + wxz' + w'x'z.

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b) Reduce the function

 $f(A,B,C,D) = \Sigma m(2,3,6,7,9,12,13,14) + \Sigma d(4,5)$ using tabulation method and realize using NAND gates.

OR

 a) Give the simplified expression for the following function where d represents don't care condition. Represent the simplified function using logic gates.

$$f(A, B, C, D) = \Sigma m (0, 8, 11, 12, 15) + \Sigma d (1, 2, 4, 7, 10, 14)$$

b) Design and implement a 4-bit gray code to binary converter.

Module - III

15. Explain the working of a T flip-flop. Design a counter using T flip-flops that has a repeated binary sequence of states 0, 1, 3, 7, 6, 4.

OR

- a) With a neat diagram explain the working of master slave flip flop.
 - b) Construct a 4-bit ring counter. Draw the timing diagram and explain its working. 10

