



Reg. No. :

Name :

Third Semester B.Tech. Degree Examination, December 2012
(2008 Scheme)

08.305 : DIGITAL SYSTEM DESIGN (RF)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer all questions.

- Convert the following numbers to decimal equivalent
 - $(ABC.1D)_{16}$
 - $(756.31)_8$
 - $(1011.011)_2$
 - $(543.120)_6$
- Write notes on Error Detection Codes.
- Subtract the following numbers using 9's complement and 10's complement method of addition.
 - $(99758.1750)_{10} - (2565.12)_{10}$
 - $(13.875)_{10} - (789.13)_{10}$
- Implement the following function using a 4×1 Multiplexer
 $f(A, B, C) = \sum(1, 3, 5, 6)$
- Differentiate between a decoder and a De-Multiplexer.
- Simplify the following function as product of sum form
 $f(a, b, c, d) = \sum(1, 3, 7, 11)$, $D = \sum(0, 2, 5, 15)$ [$D \rightarrow$ don't cares].
- Implement the following function using NOR gates only
 $f(x, y, z) = (x' + y).(y' + z).(x + z)$
- What is race-around condition ? Explain.
- Explain the working of T-flipflop.
- What is meant by Excitation Table ?
Give the excitation table for JK-flipflop.



(10×4=40 Marks)



PART – B

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

Module – I

11. a) Explain how negative numbers are represented in a base-r number system. 5
- b) Perform the following conversions
- i) $(27/32)_{10}$ to base-5
 - ii) $(2\ 3/8)_{10}$ to base-7
 - iii) $(131.5625)_7$ to binary
 - iv) $(9.1A)_{16}$ to base-4
 - v) $(357.517)_8$ to Hexadecimal 15

OR

12. a) Explain the self-complementary property of excess-3 code. 5
- b) Subtract the following numbers using both r's complement and (r-1)'s complement method of subtraction.
- i) $(11101.101)_2 - (1001.10)_2$
 - ii) $(A1BC.166)_{16} - (9A7.09)_{16}$
 - iii) $(9873.6)_{BCD} - (75.15)_{BCD}$ 15

Module – II

13. a) The following Boolean expression $BE + B'DE'$ is a simplified version of the expression $A'BE + BCDE + BC'D'E + A'B'DE' + B'C'DE'$. Is there any Don't Care conditions? If so, what are they? 8
- b) Design a combinational circuit that converts a decimal digit from the 8421 code to Excess – 3 code. 12

OR



14. a) Obtain the simplified expressions in sum of products and product of sum for the following.

$$F(A, B, C, D, E) = BDE + B'C'D + CDE + A'B'CE + A'B'C' + B'C'D'E \quad 10$$

- b) Design a 4-bit full adder with look-ahead carry. 10

Module – III

15. Design a BCD Ripple Counter. 20

OR

16. a) Show the logic diagram of a clocked RS-flipflop with 4 NAND gates. 10

- b) Write notes on Programmable Logic Devices. 10
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