Code No: 113BS **R13**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**B.Tech II Year I Semester Examinations, December-2014**
**DIGITAL LOGIC DESIGN**
**(Computer Science and Engineering)**

**Time: 3 Hours** **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

**Part- A** **(25 Marks)**

| | | |
|---|---|---|
| 1.a) | What are the simplest technique for detecting errors? | [2M] |
| b) | What are the basic operations in Boolean algebra? | [3M] |
| c) | What is race around condition? How it is avoided? | [2M] |
| d) | What is maxterm? | [3M] |
| e) | What is a ripple carry-adder? | [2M] |
| f) | What is a priority encoder? | [3M] |
| g) | What is a full modulus counter? | [2M] |
| h) | What are the various methods used for triggering flip-flops? | [3M] |
| i) | What are types of ROM? | [2M] |
| j) | What is PLA? | [3M] |

**Part- B** **(50 Marks)**

2.a) Covert $105.15_{10}$ to binary, octal, hexadecimal.
b) What is hamming code? How is the hamming code word tested and corrected.

**OR**

3.a) Simplify the following Boolean expressions using the Boolean theorems.
i) (A+B+C) (B'+C) + (A+D) (A'+C)
ii) (A+B) (A+B') (A'+B)
b) Why a NAND and NOR gates are known as universal gates? Simulate all the gates.

4.a) Simplify $Y = \sum m(3, 6, 7, 8, 10, 12, 14, 17, 19, 20, 21, 24, 25, 27, 28)$ using K-map method.
b) Obtain
i) minimal SOP and
ii) minimal POS expressions for the following function
$F(A, B, C, D) = \sum m(0, 1, 5, 8, 9, 10)$

**OR**

5. Obtain the minimal SOP expression for the switching function using k-map. $Y = \sum m(1, 5, 7, 13, 14, 15, 17, 18, 21, 22, 25, 29) + \sum d(6, 9, 19, 23, 30)$ Draw and explain the logic diagram.