Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**PDDC - SEMESTER–II EXAMINATION – SUMMER 2016**

**Subject Code:X21102** **Date:02/06/2016**

**Subject Name:DIGITAL LOGIC DESIGN DESIGN**

**Time:10:30 AM to 01:00 PM** **Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | Answer the following questions(any four)<br>$(362.52)_8 = (\ \ )_2 = (\ \ )_{10}$<br>$(163.875)_{10} = (\ \ )_2$<br>$(2FB.7C)_{16} = (\ \ )_2 = (\ \ )_{10}$<br>Multiply 1101 with 110 in binary | **07** |
| | **(b)** | Do as directed<br>Subtract 27.50 from 68.75 using 12 bit 1's complement arithmetic.<br>Subtract 507D.56 from 4AB.68 USING 16's complement method, if these numbers are base 16 numbers.<br>Add 679.6 with 536.8 in 8421 code. | **07** |
| **Q.2** | **(a)** | Simplify a function using Boolean algebra<br>F(A,B,C,D) = A + [B+C'(AB+AC')'] | **03** |
| | | Simplify a function using K-Map<br>F(K,L,M,N) = K'LM'+K'M'N+KLM'N'+LMN' | **04** |
| | **(b)** | Reduce using Tabulation Method F=π M(2,3,8,12,13) . d(10,14) | **07** |
| | | **OR** | |
| | **(b)** | Simplify a function using K-Map<br>F = A'BC'D'E'+ABC'D'E'+A'BC'DE'+A'BCD'+A'B'CD'E+ ABCD'E'+ABCD'E+A'BC'DE | **07** |
| **Q.3** | **(a)** | Design a combinational circuit that multiplies a number by 5, input decimal digit is represented by BCD. Show that output can be obtained from the input lines without using any logic gates. | **07** |
| | **(b)** | Implement F(A,B,C,D)=∑ (0, 1, 3, 4, 8, 9 15) Using a suitable Multiplexer, use D as input line. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain ROM and PLA. | **07** |
| | **(b)** | How look ahead carry generator works? How is it advantageous with respect to binary parallel Adder? Give its combinational logic and its integrated circuits. | **07** |
| **Q.4** | **(a)** | Explain 4-bit Asynchronous Up/Down counter using J K Flip flop | **07** |
| | **(b)** | Achieve given sequence using 4-Bit synchronous counter.<br>0-2-4-6-8-10-12-14-0-2…… | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Draw and explain 4-Bit synchronous counter. | **07** |
| | **(b)** | Make flip flop conversions.<br>1. J K Flip flop to D Flip flop<br>2. S R Flip flop to J K Flip flop | **07** |

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|---|---|---|---|
| **Q.5** | **(a)** | Explain memory unit. | **07** |
| | **(b)** | Describe process of inter register transfer. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain arithmetic micro operation. | **07** |
| | **(b)** | Explain the process of designing a simple computer. | **07** |

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