Seat No.:	Enrolment No.
Seat No.:	Elifolilient No.

Subject Code: X21102

**Subject Name: Digital Logic Design** 

## **GUJARAT TECHNOLOGICAL UNIVERSITY**

PDDC - SEMESTER-II • EXAMINATION - SUMMER • 2014

Date: 24-06-2014

		me: 10:30 am - 01:00 pm  Total Marks: 70  tructions:  1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks.	
Q.1	(a)	Do a directed  1) $(52)_{10} = ( )_2$ 2) $(367.52)_{10} = ( )_8$ 3) $(2598)_{10} = ( )_{16}$ 4) $(101111010001)_2 = ( )_{10}$ 5) $(231)_8 = ( )_{10}$ 6) State Identity Law & Inverse Law. 7) Find 10's complement of $(52520)_{10}$ .	07
	<b>(b)</b>	State and prove De Morgan's Theorems with the help of truth tables.	07
Q.2	(a) (b)	Define the following terms:  1) Literal  2) Logic gate  3) Fan out  5) Universal gate  6) Propagation delay  7) Register  Simplify the following expressions and implement with NAND gate circuits:	07 07
		1) $F(A,B,C,D) = BD + BCD^{\dagger} + AB^{\dagger}CD^{\dagger}$ 2) $F(X,Y,Z) = \sum (0,6)$ <b>OR</b>	
	<b>(b)</b>	Simplify the following Boolean function by using tabulation method: $F(A,B,C,D) = \sum (0,1,2,8,10,11,14,15)$	07
Q.3	(a) (b)	Define combinational logic circuit and implement the full subtractor circuit.  Design a BCD to Decimal decoder.  OR	07 07
Q.3	(a) (b)	Implement a full adder circuit with a decoder and two OR Gates.  Design Mod 10 Counter using J-K Flip flop.	07 07
Q.4	(a) (b)	What is race around condition? Explain the Master-Slave J-K flip-flop. Explain 3-to-8 line decoder with diagram and truth table.  OR	07 07
Q.4	(a)	What is Multiplexer? With logic circuit and functional table explain the working of 8-to-1 line multiplexer.	07
	<b>(b)</b>	Design a 3-bit up binary counter.	07
Q.5	(a) (b)	Explain 4-bit bidirectional shift register with parallel load in detail. What is the difference between Latch and Flip-flop? Explain D flip flop in brief.	07 07
0.5	(.)	OR	05
Q.5	(a) (b)	Explain in brief arithmetic logic unit.  What is the difference between hardwired control and micro program control?  Write advantages and disadvantages of each method.	07 07
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1