Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III EXAMINATION – WINTER 2015

Subject Code:130701 **Date:29/12/2015**

Subject Name: Digital logic design

Time: 2:30pm to 5:00pm **Total Marks: 70**

Instructions:

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

Q.1 **(a)** Convert the following Hexadecimal numbers to Octal **06**

(a) 4F7.A8 (b) BC70.OE (c) 42FD

(b) Prove that **08**

(i) $A[B+C(\overline{AB+AC})] = AB$

(ii) $A\overline{B}(C+BD) + \overline{A}\,\overline{B} = \overline{B}C$

Q.2 **(a)** Minimize the following multiple output functions using K-Map **07**

(i) $F1 = \sum m=(0,2,6,10,11,12,13) + d(3,4,5,14,15)$

(ii) $F2 = \pi M(0,4,9,10,11,14,15)$

(b) Describe briefly TTL fanin, fanout & noise margin with suitable sketches **07**

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(b) Design a combinational circuit whose input is a four bit number & whose output is the 2's complement of the input number **07**

Q.3 **(a)** Draw the logic diagrams of NAND & NOR gates & explain why they are called as universal gates **07**

(b) Explain error detecting & correcting codes with the help of a suitable example. **07**

OR

Q.3 **(a)** Explain excess -3 code & gray code **07**

(b) State & explain Demorgan's theorem **07**

Q.4 **(a)** Convert the following to other canonical form **07**

(i) $F(x,y,z) = \sum(1,3,7)$

(ii) $F(A,B,C,D) = \pi (0,1,2,3,4,6,12)$

	(b)	Implement combinational logic using 8:1line MUX for $F(A,B,C,D) = \sum m(0,2,4,5,7,9,12,15)$	**07**

OR

Q.4	**(a)**	Draw & explain the operation of 4 bit binary parallel adder	**07**
Q.4	**(b)**	Draw the logic diagram of 3 to 8 line decoder. Explain its operation with truth table	**07**
Q.5	**(a)**	State & explain any four operating characteristics of a flip flop	**07**
	(b)	Draw the state diagram & state table for Moore type sequence detector to detect the sequence 110	**07**

OR

Q.5	**(a)**	Explain arithmetic micro operations with the help of a block diagram	**07**
	(b)	Discuss the differences between hard wired control & micro program control. State the merits of one over the other	**07**

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