Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – WINTER • 2014

Subject Code: 2131704 **Date: 20-12-2014**

Subject Name: Digital Logic Circuits

Time: 02.30 pm - 05.00 pm **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)**	Design a 3 bit combinational circuit for converting binary code to gray code	**07**
	(b)	Do as directed:	
		1. Convert $(B65F)_{16}$ to decimal	**01**
		2. Find the tens complement of $(52520)_{10}$	**02**
		3. Write the reflected code for 3 bits	**02**
		4. Subtract $(3250\text{-}72532)_{10}$ using 10s compliment	**02**
Q.2	**(a)**	Simplify 1. A'B + A'BC' + A'BCD + A'BC'D'E 2. (P+Q+R) (P' + Q' + R') P	**07**
	(b)	1. State and prove demorgan's theorem 2. Define: a) Positive and negative logic b) Propagation delay c) Fan-out	**07**
		OR	
	(b)	Simplify the following Boolean function using K-map 1. F=x'yz+xy'z+xyz+xyz' 2. F=A'C+A'B+AB'C+BC	**07**
Q.3	**(a)**	Simplify the Boolean function using K-map in 1) Sum of product 2) product of sum (d is don't care condition) F=A'B'D'+A'CD+A'BC d= A'BC'D+ACD+AB'D'	**07**
	(b)	Simplify the Boolean function using the tabulation method F(A,B,C,D,E,F,G)=∑(20,28,38,39,52,60,102,103,127)	**07**
		OR	
Q.3	**(a)**	What is encoder? With logic circuit and truth table explain the working of Octal to binary encoder.	**07**
	(b)	Design a combinational circuit for full adder and full subtractor	**07**
Q.4	**(a)**	Design a 3-bit binary counter using T flip-flop	**07**
	(b)	Write short note any two flip-flops of your choice (include circuit diagram, characteristic table, characteristic equation and symbol)	**07**
		OR	
Q.4	**(a)**	Write a note on binary ripple counter	**07**
	(b)	List the characteristics of digital logic families. Define any two characteristics.	**07**
Q.5	**(a)**	Explain arithmetic, logic and shift micro operations	**07**
	(b)	Explain R-2R ladder type DAC	**07**
		OR	
Q.5	**(a)**	Explain Successive Approximation ADC	**07**
	(b)	Design a circuit for a 4 bit BCD adder	**07**

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