Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2130306 **Date: 09/06/2017**

Subject Name: Fundamentals of Digital 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.**

			Marks
Q.1		**Short Questions**	**14**
	1	A+A.B = …… **A** A **B** AB **C** 1+B **D** 1	
	2	The truth table of 5 input NOR gate will have _____ rows to include all possible input combination. **A** 12 **B** 64 **C** 16 **D** 32	
	3	Adding inverters to the input of an OR gate produces ……. logic function. **A** NOR **B** NAND **C** AND **D** Ex-OR	
	4	A 6 variable K map for SOP form has _____cells. **A** 6 **B** 16 **C** 32 **D** 64	
	5	If two voltage levels are -5 and -10, in negative logic the -5v level is called_..... level. **A** 0 **B** 1 **C** 0.5 **D** All	
	6	…… number of flip-flops are required to reduce frequency by 32. **A** 3 **B** 4 **C** 6 **D** 5	
	7	A ring counter uses …… FFs. **A** D **B** JK **C** RS **D** T	
	8	The output for a gate is low when at least one input is low, the gate is ……. **A** AND **B** OR **C** NAND **D** NOR	
	9	The output for a gate is high if and only if all inputs are low, the gate is …… **A** Ex-OR **B** NAND **C** NOR **D** OR	
	10	Draw the truth table of Ex-OR and Ex-NOR Gates.	
	11	What is the full form of FPGA?	
	12	Define SSI, MSI, LSI and VLSI.	
	13	Give difference between combinational and sequential circuits.	
	14	List different types of logic family of integrated circuits.	

Q.2	**(a)**	The product of maxterm form of the function xy+x'z is_____	**03**
	(b)	Simplified Boolean function of function F(A,B,C,D)= ∑(0,1,2,3,4,5,6,12,13,14,15).	**04**
	(c)	Design a combinational circuit of full adder.	**07**
		OR	
	(c)	Design a combinational circuit of full substractor.	**07**
Q.3	**(a)**	Convert hexa decimal number $(ABCD)_{16}$ into decimal, binary and octal number.	**03**
	(b)	Subtract two binary numbers using 2's complement: 1101-1110 = _____	**04**
	(c)	Simplified Boolean function of F(A,B,C,D,E)= ∑(0,2,4,6,9,11,13,15,17,21,25,29,31) + d(1,5).	**07**
		OR	
Q.3	**(a)**	Simplify Boolean function f (A,B,C,D,E) = A+AB+ABC+ABCD+ABCDE+B using Boolean algebra.	**03**
	(b)	Simplify Boolean function f (A,B,C,D) = π(0,1,2,3,4,5,6,12,13,14,15)using K-MAP.	**04**
	(c)	Simplified Boolean function of F(A,B,C,D,E)= ∑(0,2,4,6,9,11,13,15,17,21,25,29,31)using tabulation method.	**07**
Q.4	**(a)**	Draw and explain encoder.	**03**
	(b)	Write a short note on ROM.	**04**
	(c)	Draw and explain 4 bit magnitude comparator circuit..	**07**
		OR	
Q.4	**(a)**	Write a short note on multiplexer.	**03**
	(b)	Write a short note on PAL	**04**
	(c)	Draw and explain BCD adder circuit.	**07**
Q.5	**(a)**	Draw and explain JK flip flop.	**03**
	(b)	Write a short note on shift register.	**04**
	(c)	Draw and explain 3 bit binary counter using RS flip flop.	**07**
		OR	
Q.5	**(a)**	Draw and explain T flip flop.	**03**
	(b)	Draw and explain master slave flip flop.	**04**
	(c)	Explain different types of ADC.	**07**

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