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

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2142406 **Date: 06/06/2017**

Subject Name: Digital Electronics and its applications

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.**

Q.1		**Short Questions**	**14**
	1	$(153)_{10}$ = ($)_8$	
	2	What is role of complements in Digital Computer?	
	3	Define Register.	
	4	Give package name of Integrated circuits.	
	5	Draw block diagram of combinational circuit?	
	6	Multiplexer is _____ circuit. (Sequential, Combinational, Counter, Analog).	
	7	Draw block diagram of PLA.	
	8	1 Kilobyte = ( ) bytes.	
	9	Draw symbol of buffer and Inverter.	
	10	Define FLIP-FLOP.	
	11	What is volatile memory? Give its types.	
	12	What is universal gate?	
	13	Draw block diagram of ROM.	
	14	Define: - Fan out.	
Q.2	**(a)**	Define Boolean Algebra? Explain in detail Duality Principles with examples.	**03**
	(b)	State and prove De 'Morgan's Theorems with the help of truth tables.	**04**
	(c)	Simplify the Boolean function using K-MAP. $F = \Sigma(0,1,2,4,5,6,8,9,12,13,14)$.	**07**
		OR	
	(c)	Explain with necessary diagram AND-OR-INVERT and OR- AND-INVERT Implementation.	**07**
Q.3	**(a)**	What is K map? What is disadvantage of map method? How it can be overcome.	**03**
	(b)	Compare Combinational logic and Sequential logic in tabular form.	**04**
	(c)	Write a brief note on edge-triggered SR and JK Flip-Flops.	**07**
		OR	
Q.3	**(a)**	Explain how JK flip flop can be used to implement D flip flop.	**03**
	(b)	Construct 4×16 Decoder with help of two 3×8 Decoder.	**04**
	(c)	With logic diagram explain the operation of 4 bit binary ripple counter. How up counter can be converted into down counter?	**07**
Q.4	**(a)**	Explain the Concept of register transfer level.	**03**
	(b)	Explain with necessary sketches PLA control.	**04**
	(c)	What is tabulation method? Simplify the Boolean function $F(w,x,y,z) = \Sigma(1,3,7,11,15)$ and don't care condition	**07**

D (w, x, y,z) = Σ(0,2,5).

OR

Q.4	**(a)**	What is basic requirements of memory? Explain in brief EEPROM.	**03**
	(b)	Explain in details Triggering of flip-flops.	**04**
	(c)	What do you understand by subtractor? Design a full-adder with two half-adders and an OR gate.	**07**
Q.5	**(a)**	Compare RAM and ROM in all aspects.	**03**
	(b)	Discuss in brief micro-programmed control unit.	**04**
	(c)	Write a detailed note on: - Magnetic-core memory.	**07**

OR

Q.5	**(a)**	Compare SDRAM and DRAM in tabular form.	**03**
	(b)	Define (1) Accumulator (2) ALU register	**04**
	(c)	Describe Processor organization using scratchpad memory with block diagram. What is the limitation of this type of organization and how we overcome this Limitation?	**07**

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