## **GUJARAT TECHNOLOGICAL UNIVERSITY** BE - SEMESTER-IV (New) EXAMINATION – WINTER 2015

Subject Code:2142406 Date:3				
Time: 2:30pm to 5:00pm Total Mark				
	2. 3.	Make suitable assumptions wherever necessary. Figures to the right indicate full marks.		
Q.1	(a)	Do following conversions. 1) $(109.125)_{10} = ( \_ )_2$ 2) $(BC64)_{16} = ( \_ )_{10}$ 3) $(0111)_2 = ( \_ )_{EX-3}$ 4) $(01011110)_2 = ( \_ )_{GRAY}$ 5) $(101011)_{GRAY} = ( \_ )_2$ 6) $(0.8215)_{10} = ( \_ )_2$ 7) $(2345.99)_{10} = ( \_ )_{16}$	07	
	(b)	<ul> <li>Perform following arithmetic operation <ol> <li>(0011.1001)<sub>2</sub> - (0001.1110)<sub>2</sub> = () using 2's complement method.</li> <li>(1011)<sub>2</sub> x (101)<sub>2</sub> = () without converting it into Decimal.</li> </ol> </li> </ul>	07	
Q.2	(a) (b)	Draw timing characteristics of Read cycle for a memory. Define & indicate (1) Read cycle time (2) Access Time (3)Data hold Time With a neat diagram explain the operation of 4-bit SISO register. Also draw the timing diagram & write its truth table only.	07 07	
	<b>(b)</b>	Enlist various application of shift register. Discuss Ring counter in brief.	07	
Q.3	(a)	1) Realize expression using minimum NAND gates only.	07	
		$Y = A\overline{B} + A\overline{C} + C + AD + A\overline{B}C + ABC$		
		2) Simplify $Y = (P + Q + R) (\bar{P} + \bar{Q} + \bar{R})P$		
	(b)	Simplify following Boolean function with Karnaugh Map $F(A, B, C, D) = \sum (0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$	07	
Q.3	<b>(a)</b>	For the following function implement the SOP circuit.	07	
	(b)	$F (A, B, C, D) = \sum m (2, 3, 5, 7, 12) + \sum d (6, 13, 14, 15)$ Simplify following Boolean expression & draw logic circuit for following function using only NOR gates. $F = AB\bar{C} + AB(C + D)$	07	
Q.4	(a) (b)	Write the truth table of full adder & design full adder using two half adder. Explain two bit Magnitude Comparator with gate level circuit & truth table.	07 07	
Q.4	(a)	Design & discuss full subtractor using 3 X 8 decoder.	07	

Q.5	(a)	Give a brief note on edge triggered S-R & J-K Flip-Flops.	07
-	<b>(b)</b>	Give classification of memory. Differentiate SRAM & DRAM	07
		OR	
Q.5	<b>(a)</b>	Write a short note on Master – Slave J-K Flip-Flop.	07
	<b>(b)</b>	Discuss Following	07
		1) Accumulator Register	
		2) ALU Status Register	
		3) Scratchpad memory	

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