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S.E. (Computer Engineering) (I Sem.) EXAMINATION, 2018 DIGITAL ELECTRONICS AND LOGIC DESIGN (2015 PATTERN)

Time: Two Hours

Maximum Marks: 50

- N.B. :— (i) Attempt Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6, Q. 7 or Q. 8.
 - (ii) Neat diagram must be drawn wherever necessary.
 - (iii) Assume suitable data, if necessary.
- 1. (a) How will you implement full-adder using half-adder? Explain the circuit diagram. [6]
 - (b) How lockout condition in counter is avoided? [2]
 - (c) Draw and explain Ring counter using JK flip-flop (Timing Diagram is expected). [4]

Or

- 2. (a) Design full Subtractor using multiplexer IC 74151. [4]
 - (b) Compare synchronous and asynchronous counter. [2]
 - (c) Simplify the following function using Qunie-McCluskey minimization technique:

 $Y(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 11, 14).$ [6]

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3.	(<i>a</i>)	Design an ASM chart for 2-bit UP counter using mode cont	rol
		line.	[6]
		When M = I UP counting	
		When M = 0 remain in same state.	
	(<i>b</i>)	Implement the following function using PAL:	
		$F1(A, B, C, D) = \Sigma m (1, 3, 4, 6, 9, 12, 14)$	
		$F2(A, B, C, D) = \Sigma m (1, 2, 3, 7, 12, 15).$	[4]
	(c)	Define PLD. Mention different types of PLD.	[2]
		Or	
4.	(a)	Write VHDL code full adder using behavioural style	of
	X)	modeling.	[4]
	(<i>b</i>)	Explain entity declaration for 4: 1 multiplexer having ena	ble
		line.	[2]
	(<i>c</i>)	Design BCD to Excess-3 code converter using PLA.	[6]
			0
5.	(a)	Draw three input standard TTL NAND gate and explain	its
		operation.	[5]
	<i>(b)</i>	Explain the interfacing of TTL and CMOS:	[8]
		(i) CMOS driving TTL	
		Explain the interfacing of TTL and CMOS: (i) CMOS driving TTL (ii) TTL driving CMOS.	
		Or	
6.	(a)	Draw and explain wired AND gate in detail.	[5]
	(<i>b</i>)	Explain the characteristics of digital IC.	[4]
	(c)	Explain with a neat diagram CMOS NOR gate.	[4]
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7.	(<i>a</i>)	Explain addressing modes of 8051 with example (any three): [6]	
	(<i>b</i>)	List any <i>eight</i> applications of microcontroller 8051. [4]	
	(c)	Explain the following pins of 8051: [3]	
		(i) RXD	
		(ii) $\overline{ ext{PSEN}}$	
		(iii) EA.	
		Or	
8.	(<i>a</i>)	State the registers used in Timer/counter operation. Explain	
		TMOD register. [5]	
	(b) \(\cdot \)	Explain the following instructions with respective to microcontroller	
	X)	8051 and give example of each: [8]	
		(i) MUL	
		(ii) L JUMP	
		(iii) SWAP	
		(iv) PUSH.	6
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