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E. (Computer Engineering) (I Sem.) EXAMINATION, 2018

DIGITAL ELECTRONICS AND LOGIC DESIGN

(2015 PATTERN)

: Two Hours

Maximum Marks : 50

:- (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.

(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

(a) Design full Subtractor using multiplexer IC 74151. [4]

(b) Compare synchronous and asynchronous counter. [2]

(c) Simplify the following function using Quine-McCluskey minimization technique :
 $Y(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 11, 14).$ [6]

P.T.O.

3. (a) Design an ASM chart for 2-bit UP counter using mode control line. [6]

When $M = 1$ UP counting

When $M = 0$ remain in same state.

(b) Implement the following function using PAL :

$F1(A, B, C, D) = \sum m(1, 3, 4, 6, 9, 12, 14)$

$F2(A, B, C, D) = \sum m(1, 2, 3, 7, 12, 15).$ [4]

(c) Define PLD. Mention different types of PLD. [2]

Or

4. (a) Write VHDL code full adder using behavioural style of modeling. [4]

(b) Explain entity declaration for 4:1 multiplexer having enable line. [2]

(c) Design BCD to Excess-3 code converter using PLA. [6]

5. (a) Draw three input standard TTL NAND gate and explain its operation. [5]

(b) Explain the interfacing of TTL and CMOS [8]

(i) CMOS driving TTL

(ii) TTL driving CMOS.

Or

6. (a) Draw and explain wired AND gate in detail. [5]

(b) Explain the characteristics of digital IC. [4]

(c) Explain with a neat diagram CMOS NOR gate. [4]

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- (a) Explain addressing modes of 8051 with example (any three) : [6]
- (b) List any *eight* applications of microcontroller 8051. [4]
- (c) Explain the following pins of 8051 : [3]

(i) RXD

(ii) $\overline{\text{PSEN}}$

(iii) $\overline{\text{EA}}$

Or

- (a) State the registers used in Timer/counter operation. Explain TMOD register. [5]

- (b) Explain the following instructions with respect to microcontroller 8051 and give example of each : [8]

(i) MUL

(ii) L JUMP

(iii) SWAP

(iv) PUSH