Total No. of Questions—8] [Total No. of Printed Pages—3

Seat No.	

[5459]-182

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 :

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

P.T.O.

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

When M = I UP counting

When M = 0 remain in same state.

(*b*) Implement the following function using PAL :

F1(A, B, C, D) = Σm (1, 3, 4, 6, 9, 12, 14)

F2(A, B, C, D) = Σm (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]

7. (*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

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

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

(*i*) MUL

(*ii*) L JUMP

(*iii*) SWAP

(*iv*) PUSH.