May 2017

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

Seat No.	

[5152]-562

S.E. (Computer Engineering) (I Sem.) EXAMINATION, 2017

DIGITAL ELECTRONICS AND LOGIC DESIGN

(2015 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. :— (*i*) Attempt Q. No. **1** *or* Q. No. **2,** Q. No. **3** *or* Q. No. **4,** Q. No. **5** *or* Q. No. **6,** Q. No. **7** *or* Q. No. **8.**

(*ii*) Neat diagram must be drawn wherever necessary.

(*iii*) Assume suitable data if necessary.

1. (*a*) Implement the expression using a 8 : 1 multiplexer [4]

$f(a, b, c, d) = \Sigma m(0, 2, 3, 6, 8, 9, 12, 14)$.

(*b*) What is the difference between combinational and sequential circuits ? [2]

(*c*) Simplify the following logic function using the Quine-McCluskey minimization technique : [6]

$Y(A, B, C, D) = \Sigma m(0, 1, 3, 7, 8, 9, 11, 15)$.

Or

2. (*a*) Explain in detail look ahead carry generator [6]

(*b*) Design Mod-24 counter using 7490 [2]

(*c*) Design a sequence detector using MS J-K flip-flop sequence is 1101. [4]

P.T.O.

3. (*a*) Draw ASM chart for 2-bit UP counter using multiplexer controller method. [8]

(*b*) List any *two* medeling style of VHDL [2]

(*c*) Compare concurrent and sequential statement in VHDL [2]

Or

4. (*a*) Design 4 input and 6 output combinational circuit using PLA. The input variables are A, B, C and D : [6]

$Y1 = \Sigma m(0, 3, 5, 6, 9, 10, 12, 15)$

$Y2 = \Sigma m(0, 1, 2, 3, 11, 12, 14, 15)$

$Y3 = \Sigma m(0, 4, 8, 12)$

$Y4 = \Sigma m(0, 2, 3, 5, 7, 8, 12, 13)$

$Y5 = \Sigma m(0, 1, 3, 4, 5, 6, 11, 13, 14, 15)$

$Y5 = \Sigma m(1, 2, 6, 8, 15)$.

(*b*) Draw block diagram of PLA device and explain. [6]

5. (*a*) Explain characteristics of digital ICs (any *four*). [4]

(*b*) Explain operation of TTL NAND gate. [6]

(*c*) Explain TTL open collector [3]

Or

6. (*a*) What is addressing mode ? Identify and justify addressing modes of the following 8051 instructions : [6]

(*i*) MOVX A, @DPTR

(*ii*) MOVC A, @ A+PC

(*iii*) ADD A, #10

(*iv*) MOV DPTR, #2550.

(*b*) What is microcontroller ? Distinguish between microcontroller and microprocessor. [7]

7. (*a*) Explain CMOS inverter. [4]

(*b*) Why wired logic is not possible in CMOS operation. [4]

(*c*) Explain tristate logic. [5]

Or

8. (*a*) Explain the physical structure and significances of all I/O ports of 8051 microcontroller. [7]

(*b*) Give significance of the following pins in 8051 : [6]

(*i*) PSEN#

(*ii*) EA#/VPP

(*iii*) ALE

(*iv*) TxD

(*v*) INT0#

(*vi*) RST.