Total No. of Questions—**8**] [Total No. of Printed Pages—**4**

Seat No.	

[5057]-2053

S.E. (Computer Engineering) (First Semester)

EXAMINATION, 2016

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** and Q. **7** or Q. **8**.

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

(*iii*) Assume suitable data, if necessary.

1. (*a*) Minimize the following logic function and realize using NAND gates : [4]

$$F(A, B, C, D) = \Sigma m\,(1, 3, 5, 8, 9, 11, 15) + d(2, 13).$$

(*b*) Write the rules for BCD addition and give example. [2]

(*c*) Draw and explain 3 bit Asynchrous UP counter using MS-JK flip-flop, also draw timing diagram for the same. [6]

P.T.O.

Or

2. (*a*) Design 16 : 1 Multiplexer using 4 : 1 MUX. Explain the truth table of your design. [6]

(*b*) Compare Moore and Mealy model. [2]

(*c*) Convert the following flip-flop : [4]

(*i*) JK to T

(*ii*) SR to D.

3. (*a*) What is an ASM chart ? Draw an ASM chart and state table for 2 bit UP-down counter having mode control input M :

When M = 1 : UP counting and

When M = 0 : Down counting. [6]

(*b*) Implement the following Boolean function using PAL : [6]

$F1 = \Sigma m\,(0, 2, 3, 4, 5, 6, 7, 8, 10, 11, 15)$

$F2 = \Sigma(1, 2, 8, 12, 13)$

Or

4. (*a*) Write VHDL code for full adder using : [4]

(*i*) Data Flow modeling

(*ii*) Structural modeling.

(*b*) Explain entity declaration for IC7432 (OR gate). [2]

(*c*) Implement 3 bit binary to gray code converter using PLA. [6]

5. (*a*) Compare TTL and CMOS logic family and also draw CMOS-NOR gate. [7]

(*b*) Draw three input standard TTL NAND gate circuit and explain its operation. [6]

Or

6. (*a*) State the following charteristics of digital TTL and CMOS ICs : [6]

(*i*) Figure of merit

(*ii*) Noise immunity

(*iii*) Speed of operation.

(*b*) What is logic family ? Give the classification of logic family in detail. [7]

7. (*a*) Draw and explain architecture of microcontroller 8051. [7]

(*b*) Explain any *three* addressing modes of 8051 with example. [6]

Or

8. (*a*) Discuss the function of PSW register in 8051 and also explain different flags available in PSW of 8051. [7]

(*b*) Explain the following instructions with respective to 8051 and also give example of each : [6]

(*i*) MOV A, Rn

(*ii*) SWAP A

(*iii*) SET B.