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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.