Total No. of Questions—**12**] [Total No. of Printed Pages—**4**

Seat No.	

[4957]-203

S.E. (Computer/IT) (I Sem.) EXAMINATION, 2016
DIGITAL ELECTRONICS AND LOGIC DESIGN
(2008 PATTERN)

Time : Three Hours **Maximum Marks : 100**

N.B. **:—** (*i*) Answer any *three* questions from each Section.

(*ii*) Answers to the two Sections should be written in separate answer-books.

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

(*iv*) Figures to the right indicate full marks.

(*v*) Use of calculator is allowed.

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

SECTION I

1. (*a*) Convert the following octal numbers into their equivalent binary, hexadecimal and decimal numbers : [12]

(*i*) 87

(*ii*) 0.3467

(*iii*) 1234

(*iv*) 87.02

(*b*) Express the following number in decimal. Show your step by step equation and calculations. [6]

(*i*) $(10110.0101)_2$

(*ii*) $(16.5)_{16}$

P.T.O.

Or

2. (*a*) Express the following number in binary. Show your step by step equation and calculations. [6]

(*i*) $(1010.11)_{10}$

(*ii*) $(428.10)_{10}$

(*b*) Solve the following equations using corresponding minimization techniques. [12]

(*i*) $Z = f(A,B,C,D) = \pi M\ (4,\ 5,\ 6,\ 7,\ 14,\ 15)$

(*ii*) $Z = f(A,B,C,D) = \Sigma M(0,\ 2,\ 5,\ 6,\ 8,\ 10,\ 13,\ 15)$

3. (*a*) Solve by Quine-McClusky technique : [10]

$Z = f(A,B,C,D) = \Sigma(0,\ 3,\ 8,\ 9,\ 10,\ 12,\ 15)$

(*b*) Explain standard TTL characteristics in brief. [6]

Or

4. (*a*) Draw 2-i/p standard TTL NAND gate with Totem Pole. Explain operation of transistor (ON/OFF) with suitable input conditions and truth table. [8]

(*b*) Compare TTL and CMOS logic family (Any 4 points). Also draw CMOS-NOR gate. [8]

5. (*a*) Design and implement 4-bit Gray to Binary code converter using basic gates. [8]

(*b*) Draw 4-Bit BCD Adder by using IC 7483 and logic gates. [8]

Or

6. (*a*) Design 16:1 mux using 4:1 multiplexers (with enable inputs). Explain the truth table of your circuit in short. [8]

(*b*) What do you mean by half-adder and full adder ? How will you implement full adder using half-adder. Explain with circuit diagram. [8]

SECTION II

7. (*a*) What is MOD counter ? Explain MOD-15 counter using IC 7490. Draw design for the same. [8]

(*b*) What is the defference between Asynchronous and Synchronous Counter ? Draw a 3-bit Synchronous counter. Explain timing diagram for the same. [10]

Or

8. (*a*) Explain the difference between combinational and sequential circuit. Also convert D Flip-Flop into JK-F/F and T-F/F. Show the Truth Table. [10]

(*b*) Give any four applications of Shift Registers. Also explain 4-Bit Ring Counter. [8]

9. (*a*) What is ASM chart ? Design ASM chart for 3-Bit Up-Down counter. [8]

(*b*) What is VHDL ? Explain entity architecture declaration for 2-Bit AND gate. [8]

Or

10. (*a*) What is ASM chart ? Give its application and explain the MUX controller method with the suitable example. [8]

(*b*) List any four sequential statements used in VHDL ? [8]

11. (*a*) Explain basic characteristics of FPGA. [8]

(*b*) Explain basic microprocessor architecture. [8]

Or

12. (*a*) Explain in brief, the working of Address bus, Data Bus and Control bus by assuming a basic operation. [8]

(*b*) What is the difference between CPLD and FPGA ? [8]