

22320

24225

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : 10
- a) Write theradix of Binary, Octal, Decimal and Hexadecimal number system.
 - b) Draw symbol, Truth table and Logic equation of EX-OR gate.
 - c) State Demorgan's Theorem.
 - d) State necessity of multiplexer.
 - e) Write exicitation table of D flip-flop.
 - f) Define counter.
 - g) List the type of DAC.

P.T.O.

2. Attempt any THREE of the following : 12
- a) Perform the subtraction using 2's complement methods
 $(52)_{10} - (65)_{10}$
 - b) Simplify the following Boolean expression and implement using logic gate
$$AB\overline{C}\overline{D} + AB\overline{C}D + ABC\overline{D} + ABCD$$
 - c) Minimize the following expression using K-map
 $f(A, B, C, D) = \Sigma m(0, 1, 2, 4, 5, 7, 8, 9, 10)$
 - d) Draw the block diagram of programmable logic array.
3. Attempt any THREE of the following : 12
- a) Realize the following logic operations using only NOR gates :
AND, OR, NOT
 - b) Draw binary to gray converter and write its truth table.
 - c) Describe R-S flip-flop using NAND Gate (only).
 - d) Describe the operation of 4 bit universal shift register with the help of block diagram.
4. Attempt any THREE of the following : 12
- a) Compare TTL, CMOS logic families on the basis of following.
 - i) Propagation delay
 - ii) Power dissipation
 - iii) fan out
 - iv) Basic gate
 - b) Compare the following (Any two points each)
 - i) Volatile – Non Volatile memory
 - ii) SRAM – DRAM memory
 - c) Design 1:16 Demux using 1:4 Demux.

- d) Describe the working of master slave JK flip-flop with truth table and logic diagram.
- e) Calculate analog o/p of 4 bit DAC for Digital input is 1011.
(Assume $V + S = SV$)

5. Attempt any TWO of the following : 12

- a) Design a 4 bit ripple counter using JK flip-flop with truth table and waveform.
- b) Draw block diagram of Dual slope ADC and explain its working.
- c) Describe the function of full Adder circuit using its truth table, K-map simplification and logic diagram.

6. Attempt any TWO of the following : 12

- a) Design one digit BCD adder using IC 7483.
 - b) Give block schematic of decade counter IC 7490. Design Mod-7 counter using IC 7490.
 - c) Convert the following
 - i) $(5C7)_{16} = (?)_{10}$
 - ii) $(2598)_{10} = (?)_{16}$
 - iii) $(10110)_2 = (?)_{10} = (?)_{16}$
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