

Q.P. Code : **5070**

(3 Hours)

[Total Marks : 80

- N.B. :** (1) Question No.1 is compulsory.
 (2) Attempt any three questions from the remaining.
 (3) Assume suitable data if necessary.

1. Answer the following (Any Four) : 20
- (a) Convert : (i) $(77)_8 \rightarrow (?)_{10}$
 (ii) $(111010110000111)_2 \rightarrow (?)_{16}$
- (b) Explain the working of SR Flip-flop. What is meant by edge triggering?
- (c) Design half adder using logic gates.
- (d) Explain the function of CMOS Inverter.
- (e) Determine the value of x , $(193)_x = (623)_8$.
2. (a) Perform the following : 10
- (i) $96 - 78$ using 2's complement.
 (ii) Add BCD $87 + 96$.
 (iii) Subtract BCD $13 - 06$.
 (iv) $(1101)_{\text{Binary}} \rightarrow (?)_{\text{gray}}$
 (v) $(89A)_{16} = (?)_2$
- (b) Design 4 - bit binary to gray code converter. 10
3. (a) Simplify using boolean laws and Implement using logic gates. 10
- (i) $f = \bar{A}\bar{B}C + \bar{A}\bar{B}D + BD + BC$
 (ii) $f = AB + \bar{A}C + BC$
- (b) Simplify following using k-map and implement using logic gates. 10
- $f = \sum(2, 5, 7, 15) + d(6, 9, 13)$
4. (a) Design an adder to add two BCD numbers using four bit binary IC 7483 chips and necessary gates. 10
- (b) Convert D flipflop to T flipflop. 5
- (c) Draw and explain the function of Ring counter. 5

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5. (a) Design MOD - 12 asynchronous ripple counter. 10
(b) Explain the operation of 4-bit bidirectional shift register with neat diagram. 10
6. Write short note on (Any Four) : 20
(a) De Morgan's Theorem
(b) FPGA
(c) DEMUX
(d) ASCII Codes
(e) ALU
(f) PAL and PLA.
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