

D 42031

Name

Reg. No.



**THIRD SEMESTER B.TECH. (ENGINEERING)
DEGREE EXAMINATION, DECEMBER 2007**

CS / IT 04 305 – SWITCHING THEORY AND LOGIC DESIGN

(2004 Admissions)

Time : Three Hours

Maximum : 100 Marks

Answer **all** questions.

- I. (a) Discuss about the postulates of Boolean Algebra.
(b) Simplify the function $Y = AB + A(B+C) + B(B+C)$ and draw the logic circuit for the simplified function.
(c) Implement other basic gates using only NAND gates.
(d) Derive the logic expressions for sum and carry of a Full adder.
(e) Write a brief note on Fault Diagnosis.
(f) Explain about the essential prime cube Theorem.
(g) Explain the various methods of Triggering a Flip-Flop.
(h) Explain the basic concepts of a RS latch.
- (8 × 5 = 40 marks)
- II. (a) Simplify the Boolean Function using Quine McClusky method :
 $F(A, B, C, D, E) = \Sigma(0, 2, 4, 6, 9, 13, 21, 23, 25, 29, 31)$.
Or
(b) Write short notes on the following : (i) Switching Algebra ; (ii) Karnaugh Map.
- (7 + 8 = 15 marks)
- III. (a) With the help of suitable examples, explain the difference between encoders and decoders.
Or
(b) Explain the principle of parity generators and checkers with the help of an example.
- (15 marks)
- IV. (a) Discuss the importance of testing in digital circuit design. Explain any *one* test generation method.
Or
(b) Explain PLA minimization technique with an example.
- (15 marks)
- V. (a) What do you mean by ripple counters? Design and draw the timing diagram of a modulo-10 ripple up counter.
Or
(b) What do you mean by synchronous counters? Design a module-8 synchronous binary up counter using D-flip-flop.
- (15 marks)
- [4 × 15 = 60 marks]