

# Madras University

## BCA- Digital Logic Fundamentals 2005

**TIME: THREE HOURS**

**MAXIMUM: 75 MARKS**

### **PART A - (10 x 3 = 30 marks)**

**Answer any TEN questions.**

All questions carry equal marks.

1. Convert decimal 0.6875 to binary.
2. Use 2's complement to perform M-N with the given binary number  
 $M = 1010100$   $N = 1000100$
3. Write a note on "Error-Detection Codes".
4. Prove:  $x + x = x$ .
5. Construct the truth table for  $F = xy' + x'y$ .
6. Draw the logic  $F = x'y'z + x'y'z + xy'$  circuit for the expression
7. Give the logic diagram and graphic symbol for clocked RS flip-flop.
8. What are the functions of counter?
9. Describe the use of encoders.
10. What are Demultiplexers?
11. What is meant by accumulator?
12. Explain 'Minterms' with an example.

### **PART B - (5 x 6 = 30 marks)**

Answer any FIVE questions.

All questions carry equal marks.

13. Write short notes on "Logic Gates".
14. Simplify the Boolean function using map method  $F = A'C + A'B + AB'C + BC$
15. Explain the operations of status registers.
16. What is a decoder? Draw the logic diagrams of a BCD to decimal decoder and explain.
17. Explain with a logic diagram, the working of a full-adder.
18. Describe the operation of accumulator with neat diagram.
19. Describe about alphanumeric codes and error codes.

**PART C - (4 x 10 = 40 marks)**

Answer any FOUR questions.  
All questions carry equal marks.

20. Perform the following in binary form.
- (a)  $(128)_{10} - (64)_{10}$
  - (b)  $(102)_{10} + (120)_{10}$
  - (c)  $(31)_{10} \times (14)_{10}$
  - (d)  $(25)_{10} / (5)_{10}$
21. Prove the following equations:
- (a)  $(X+Y)(X+Z) = X+YZ$
  - (b)  $(A+B'+C)(A+B'+C')(A+B+C) = A+B'C$ .
22. Explain the shift-right register and shift-left register with circuit diagram and truth tables.
23. Draw the block diagram of a ripple counter. Explain its operation. What is the advantage of a synchronous counter over ripple counter?
24. Explain the action of multiplexer and demultiplexer with suitable diagrams.
25. Describe the operation with function table of ALU.