

DE-4015

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## DISTANCE EDUCATION

B.C.A. DEGREE EXAMINATION, DECEMBER 2008.

First Year

## ELECTRONICS DEVICES AND DIGITAL CIRCUITS

(Upto 2002 Batch)

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

1. (a) (i) Explain Gray code with examples. (5)  
 (ii) Use 2's complement to perform M-N with the given binary numbers. (5)  
 $M = 1010100$   
 $N = 1000100$ 
  - (b) Draw and explain the Circuit diagram for an Adder system using 2's Complement number. (10)
2. (a) Demonstrate by means of truth tables the validity of the following theorems of Boolean algebra.
  - (i) The associative laws.
  - (ii) De-Morgan's theorems. (10)
  - (b) Explain any four logic gates with truth tables. (10)
3. (a) Design a Combinational circuit that accepts a three-bit number and generates an output binary number equal to the square of the input number. (10)  
 (b) Explain the half adder with a neat diagram. (10)

4. (a) Show the logic diagram of a clocked D flip-flop with AND and NOR gates. (10)
- (b) Design a 4-bit Ring counter. (10)
5. (a) Explain the operation of JFET with neat diagram. (10)
- (b) Explain the characteristics of operational amplifier. (10)
6. (a) Obtain the logic diagram of a Master slave JK flip flop with AND and NOR gates. (10)
- (b) Explain shift right registers. (10)
7. (a) Implement a full subtractor with two half-subtractors and an OR gate. (10)
- (b) Simplify the Boolean function :
- $$F = A'B'C + B'CD' + A'BCD' + AB'C' \quad (10)$$
8. (a) Obtain the truth table of the function : (10)
- $$F = xy + xy' + y'z$$
- (b) Draw the three input exclusive-OR gate with truth table. (10)
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