

Mechi Multiple Campus
BCA First Semester
CACS105-Digital Logic/ MCQ Questions
First Terminal Examination 2074 Time: 20 Min

Group-“A”

Attempt all the questions

[10 X 1=10]

Circle (○) the correct answer in the following questions.

1. Temperature variation is a/an
 - a) Digital quantity
 - b) Analog quantity
 - c) Either Digital or Analog quantity
 - d) None

2. Complement of NOR and OR gate is _____ and _____ respectively.
 - a) AND, NAND
 - b) NAND, AND
 - c) OR, NOR
 - d) NOR, OR

3. What is the equivalent hexadecimal number of the binary number 1011011011110010?
 - a) 1C10
 - b) B6F2
 - c) C6E2
 - d) 5050

4. What is the decimal equivalent of the octal number 237?
 - a) 157
 - b) 161
 - c) 159
 - d) 147

5. 2's Complement of 10101011 is
 - a) 01010101
 - b) 00111100
 - c) 10101011
 - d) 10110100

6. Which of the following expressions is in the sum-of-product (SOP) form?
 - a) AB+CD
 - b) AB(CD)
 - c) (A+B)(C+D)
 - d) (A)B(CD)

7. What is the equivalent gray code of the number [10110]₂?
 - a) 11011
 - b) 11001
 - c) 10111
 - d) 11101

8. To perform product of maxterms Boolean function must be brought into
 - a) AND terms
 - b) OR terms
 - c) NOT terms
 - d) NAND terms

9. What is the value of $A + \bar{A}B$ using the law of Boolean algebra?
 - a) (AB)
 - b) A (A+B)
 - c) (A+B)
 - d) A

10. How Many output lines will a BCD-to-Decimal decoder have?
 - a) 8
 - b) 10
 - c) 16
 - d) 4

Mechi Multiple Campus
BCA First Semester
CACS105-Digital Logic/ Subjective Type Questions
First Terminal Examination 2074 PM: 24 FM: 60 Time: 2.40 Hrs

Candidates are required to answer all the questions in their own words as far as practicable.

Group –“B”

Attempt any SIX Questions.

[6*5=30]

1. What is meant by digital system? Distinguish between discrete time signal and digital signal giving examples. [1+4]
2. State De Morgan's Law. Expand it for 3 variables and prove using the truth table. [2+1+2]
3. Perform the following operations:
 - a. $(1001001.011)_2 = (?)_8 = (?)_{10} = (?)_{16}$ [3]
 - b. Subtract 65 from 40 using 2's complement method. [2]
4. Reduce the given expression to a minimum number of literals using Boolean algebra rules, implement both sides using circuit diagram and verify using truth table. [5]
 $\bar{X}\bar{Y}Z + \bar{X}YZ + X\bar{Y}$
5. Why NAND and NOR gates are called Universal gates. Show that all basic gates (NOT, OR, AND) can be realized. [1+4]
6. Explain XOR and XNOR with functional expression, digital symbol, truth table and timing diagram. [5]
7. Express the Boolean Function $F=A+\bar{B}C$ in a sum of minterms. [5]

Group –“C”

Attempt any TWO Questions.

[2*10=20]

1.
 - a) Draw a logic symbol, truth table, and circuit diagram (NAND only) for the Half Adder. [5]
 - b) Write the Functional expression, truth table and circuit implementation of Full Adder. [5]
2. Minimize the following Boolean functions using K-map.
 - a) $F(w, x, y, z) = \sum(0, 1, 2, 9, 11, 15) + D(8, 10, 14)$ [6]
 - b) $(A+B+C)(A+B+\bar{C})(A+\bar{B}+C)(A+\bar{B}+\bar{C})(\bar{A}+\bar{B}+C)$ [4]
3.
 - a) Define combinational circuit. Write the complete steps for design procedures of a combinational logic circuit. [1+4]
 - b) Explain the operation of BCD-to-Decimal decoder with truth table and circuit diagram. [5]