

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

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**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

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**CACS105-Digital Logic/ Subjective Type Questions**  
**First Terminal Examination 2074 PM: 24 FM: 60 Time: 2.40 Hrs**

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*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]