# BRAINWARE UNIVERSITY

## Term End Examination 2024-2025
## Programme – BCA(MAWT)-Hons-2024
## Course Name – Digital Logic
## Course Code - BMT17201 (T)
## ( Semester I )

**Full Marks : 40** **Time : 2:0 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

### Group-A
(Multiple Choice Type Question) 1 x 10=10

1. *Choose the correct alternative from the following :*

(i) Show the octal number representation of Decimal 0.345.
a) 0.2404 b) 0.2605
c) 0.1945 d) 0.1605

(ii) Find binary equivalent of the octal number 725.
a) 111101101 b) 111011101
c) 111101010 d) 111010101

(iii) Which digital code is a reflective code used primarily in analog-to-digital converters?
a) BCD b) Excess-3 Code
c) Gray Code d) ASCII

(iv) What is the range of values that can be represented by an 8-bit unsigned binary number?
a) -256 to 255 b) 0 to 127
c) -128 to 127 d) 0 to 255

(v) Select output of a full subtractor is same as-
a) Decoder b) Half subtractor
c) Full adder d) Half adder

(vi) Select how the sum output is calculated in a half-adder when the inputs are A and B.
a) A EXNOR B b) A EXOR B
c) A OR B d) A AND B

(vii) Which of the following logic gates can be used to implement a 2-to-1 multiplexer?
a) NAND gates b) NOR gates
c) AND, OR, and NOT gates d) XOR gates

(viii) How many inputs are required for a 4-to-16 decoder?
a) 5 b) 4
c) 3 d) 2

(ix) Identify the related expression for Absorption law in Boolean expression.

a) A+AB=A
b) AB+AA'=A
c) A+AB=BA
d) A+B=B+A

(x) Apply Boolean Law, then A+1 = ____.

a) 1
b) A
c) 0
d) A'

## Group-B
(Short Answer Type Questions) 3 x 5=15

2. Explain flip-flops. (3)
3. What is a logic gate? List the basic types of logic gates. (3)
4. Simplify the following Boolean expression:(A+B).(A+B'). (3)
5. a)Convert 59.7210 to BCD. b)Convert 8B3F16 to binary. (3)
6. Examine how De Morgan's Theorem simplify Boolean expressions. (3)

**OR**

Infer the significance of the Karnaugh map (K-map) in Boolean algebra. (3)

## Group-C
(Long Answer Type Questions) 5 x 3=15

7. Find the truth table of the function : (a) F = xy + xy' + y'z and (b) F = x'z' + yz. (5)
8. Develop the simplified form of the boolean function F(A,B,C,D) = ∑(1,5,9,10,11,14,15) using four-variable maps. (5)
9. Evaluate the significance of select lines in a Multiplexer and how they determine the output. (5)

**OR**

Explain the operation of a 1-to-8 Demultiplexer. Conclude with its truth table and logic diagram. (5)

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