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Answers Key:

5 Marks

1. 98.46_{10}

2	98
2	49 – 0
2	24 – 1
2	12 – 0
2	6 – 0
2	3 – 0
	1 – 1

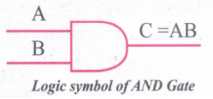
2. Fractional part
0.46 x 2 = 0.92 = 0
0.92 x 2 = 1.84 = 1
0.84 x 2 = 1.68 = 1
0.68 x 2 = 1.36 = 1
0.36 x 2 = 0.72 = 0
0.72 x 2 = 1.44 = 1
98.46_{10} = $(1100010.011101...)_2$

2. $1101010_2 + 101101_2$
1101010
+101101
_____
10010111
_____
$1101010_2 + 101101_2 = 10010111_2$

3. A gate is a basic electronic circuit which operates on one or more signals to produce an output signal.
The three fundamental gates are AND, OR and NOT gates.

AND Gate

The AND gate can have two or more input signals and produce an output signal. The output is "true" only when both inputs are "true", otherwise, the output is "false". In other words the output will be 1 if and only if both inputs are 1; otherwise the output is 0. The output of the AND gate is represented by a variable say C, where A and B are two and if input boolean variables. In boolean algebra, a variable can take either of the values '0' or '1'. The logical symbol of the AND gate is



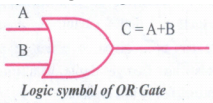
Logic symbol of AND Gate

The Truth Table For AND Gate is

Input		Output
A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

OR Gate;

The OR gate gets its name from its behaviour like the logical inclusive "OR". The output is "true" if either or both of the inputs are "true". If both inputs are "false" then the output is "false". In other words the output will be 1 if and only if one or both inputs are 1; otherwise, the output is 0. The logical symbol of the OR gate is



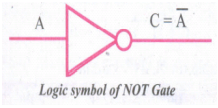
Logic symbol of OR Gate

The truth table For OR Gate is

Input		Output
A	B	C
0	0	0
0	1	1
1	0	0
1	1	1

NOT Gate;

The NOT gate, called a logical inverter, has only one input. It reverses the logical state. In other words the output C is always the complement of the input. The logical symbol of the NOT gate is

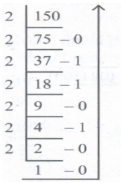


The truth table for NOT gate is

Input	Output
A	C
1	0
0	1

3 Marks

4. In Binary Number System, there are only two digits namely 0 and 1. The numbers in the binary system are represented to the base 2. In the Binary Number, the left most bit is the Most Significant Bit (MSB) and the right most bit is the Least Significant Bit (LSB). MSB has largest positional weight and LSB has smallest positional weight.
   Ex. 110010_2
5. Change it to Binary



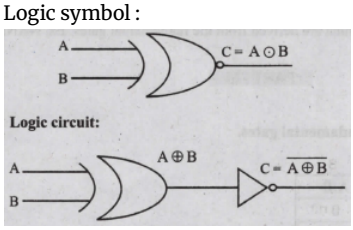
$150_{10} = 10010110_2$
Step 2 : Change it to Octal
10,010,110
421 421 421
010 010 110
Binary 10010110_2
Octal $=226_8$

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6. ISCII - Indian Standard Code for Information Interchange (ISCII) is the system of handling the character of Indian local languages. This is a 8-bit coding system. Therefore it can handle 256 (28) characters. It is recognized by Bureau of Indian Standards (BIS). It is integrated with unicode.
   The supported scripts are:
   Assamese, Bengali (Bangla), Devanagari, Gujarati, Gurmukhi, Kannada, Malayalam, Oriya, Tamil, and Telugu. ISCII does not encode the writing systems of India based on Arabic, but its writing system switching codes none the less provide for Kashmiri, Sindhi, Urdu, Persian, Pashto and Arabic. The Arabic-based writing systems were subsequently encoded in the PASCII encoding.
   ISCII is an 8-bit encoding. The lower 128 code points are plain ASCII, the upper 128 code points are ISCII-specific. In addition to the code points representing characters, ISCII makes use of a code point with mnemonic ATR that indicates that the following byte contains one of two kinds of information. One set of values changes the writing system until the next writing system indicator or end-of-line.
7. The XNOR (exclusive - NOR) gate is a combination XOR gate followed by an inverter. Its output is "true" if the inputs are the same, and "false" if the inputs are different.
   The output of XNOR is C = AB + $\bar{A}\,\bar{B}$
   = A ⊙ B
   where ⊙ indicates included dot.
   Truth table

Input		Output
A	B	C
0	0	1
0	1	0
1	0	0
1	1	1

   Logic symbol :



8. XOR - Truth table

A	B	A ⊕ B
0	0	0
0	1	1
1	0	1
1	1	0

2 Marks

9. The term data comes from the word datum, which means a raw fact. The data is a fact about people. places or some objects.
   Example : Rajesh 16, XI
10. (i) BCD - Binary Coded Decimal.
    (ii) EBCDIC - Extended Binary Coded Decimal Interchange Code.
    (iii) ASCII - American Standard Code for Information Interchange
    (iv) Unicode.
    (v) ISCII - Indian Standard Code for Information Interchange
11. The NAND is the combination of NOT and AND gates. The NAND gate is generated by inverting the output of an AND gate. The algebraic expression of the NAND is $Y = \overline{A.B}$
12. The truth table for XOR gate is

Input		Output
A	B	C
0	0	0
0	1	1
1	0	1
1	1	0

13. A + (B + C) = (A + B) + C
    A. (B. C) = (A . B) .C

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