Unit Wise Question Bank

Department: FY BTech   **Semester: I**   **Academic Year: 2024-25**

Class: FY COMP, IT, AIDS, AIML   **Div.:A ,B,C**   **Date: 26.12.2024**

Course: Basic Electrical And Electronics Engineering

Unit No. - name	Q. No.	Question	Marks	CO	Blooms Level
Unit 6: Digital Electronics Fundamental	1.	Write the Symbol, Truth Table and Output Expression for following gates. 1) OR 2) NAND	5	6	1

1 Marks

1 Marks

$Y = A + B$

½ Marks

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1 Marks

A	B	C
0	0	1
0	1	1
1	0	1
1	1	0

1 Marks

$$Y = \underline{AB}$$

½ Marks

2.	Write the Symbol, Truth table and Output Expression for following gates.
	    1) NOR
	    2) AND
		5	6	2

NOR GATE

$C = \overline{A + B}$
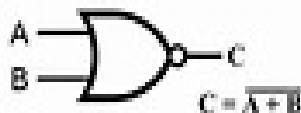
TRUTH TABLE

INPUT		OUTPUT
A	B	A NOR B
0	0	1
0	1	0
1	0	0
1	1	0

1 mark -symbol
1 mark -truth table
½ mark-symbol

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AND GATE   1 mark -symbol
                              1 mark -truth table
                              ½ mark-symbol

	Write the Symbol, Truth table and Output Expression for following gates.	5	6	2
3.	1) Ex-OR 2) NOT			
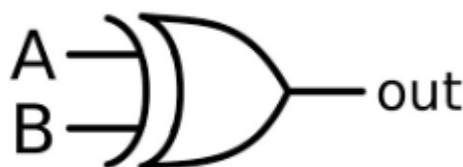
EX-OR Gate $Y = A \oplus B$ 1 mark -symbol

                              1 mark -truth table
                              ½ mark-symbol

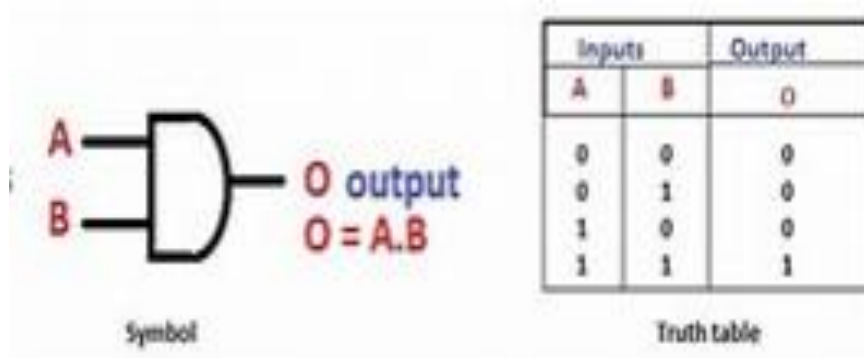**Course Faculty**   **Prof. Karuna Mahajan**

NOT Gate

Symbol

A ——▷o— C

$C = \overline{A}$
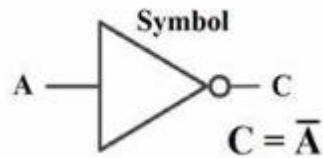
Truth Table

INPUT	OUTPUT
A	NOT A
0	1
1	0

4.	Write the Symbol, Truth table and Output Expression for following gates. 1) AND 2) Ex-OR	5	6	1

As Above Stated Q2 and Q3

5.	State and Explain De-Morgan's Theorem (Any One).	5	6	2

A	B	A+B	$\overline{A+B}$	$\overline{A}$	$\overline{B}$	$\overline{A}.\overline{B}$
0	0	0	1	1	1	1
0	1	1	0	1	0	0
1	0	1	0	0	1	0
1	1	1	0	0	0	0

3 Marks

DeMorgans First Law-It states that complement of sum of variables is equal to product of its self compliments.   1 Mark

$$\overline{A+B} = \overline{A}.\overline{B}$$ 1 Mark

A	B	$\overline{A}$	$\overline{B}$	A·B	$\overline{A·B}$	$\overline{A}+\overline{B}$
0	0	1	1	0	1	1
0	1	1	0	0	1	1
1	0	0	1	0	1	1
1	1	0	0	1	0	0

3 Marks

DeMorgans Second Law-It states that the complement of the product of variables is

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		equal to sum of its self compliments. 1 Mark $$\overline{A \cdot B} = \overline{A} + \overline{B} \qquad \text{1 Mark}$$			
6.	Draw NOT, AND, OR Gate using NAND Gate.		5	6	3

NOT Logic

A ○────[&]○──── ○ $\overline{A}$
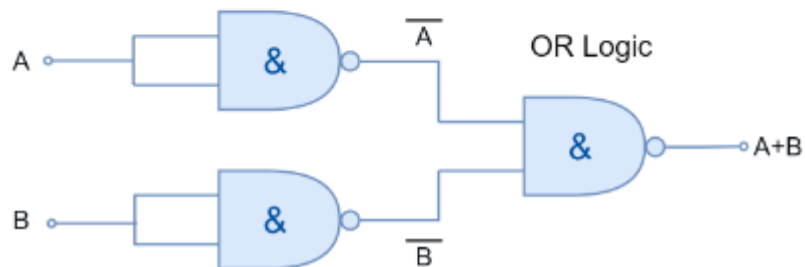
AND Logic

A ○──┐
B ○──┤ & ○ $\overline{A.B}$ ──[&]○──── ○ A.B

OR Logic

A ○──[&]○ $\overline{A}$ ──┐
                            ├──[&]○──── ○ A+B
B ○──[&]○ $\overline{B}$ ──┘

1+2+2 Marks

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7.	Draw NOT, AND, OR Gate using NOR Gate.	5	6	2
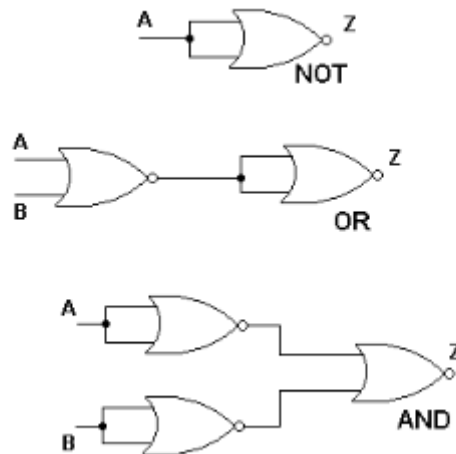
1+2+2 Marks

8.	Perform the following conversions:
	  a) $(10011)_2 = ($ $)_{10}$
	  b) $(27)_{10} = ($ $)_2$
		5	6	3

2.5 Marks

Ans: Decimal No= 19

$(27)_{10} = (11011)_2$

	2	27	Remainder
	2	13	1
	2	6	1
	2	3	0
	2	1	1
		0	1

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2.5 Marks

9.	Prepare the truth table for following equation in standard SOP form. $$Y = \bar{A}\bar{B}C + \bar{A}B\bar{C} + A\bar{B}\bar{C} + ABC$$	5	6	3

Inputs- 3 Marks
Output-2 Marks

10.	Minimize the Three variable logic function using K-map. $$f(A,B,C) = \sum m(3,5,6,7)$$	5	6	3

Ans Y=BC+AC+AB

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	K-Map- 2 Marks Grouping -1 Mark Output Y Expression-2 Marks			

11.	Perform the following Binary Addition
	    a) 1101 and 0110
	    b) 1111 and 0101
		5	6	2

	1101+0110 = 10011 2.5 marks 1111+0101=10100 2.5 marks			

12.	Perform the following Binary Subtraction
	    a) 1100 and 0010
	    b) 1011 and 0111
		5	6	3

	1100-0010=1010 2.5 marks 1011-0111=0100 2.5 marks			
13.	Perform the following Binary Multiplication 1011 and 0101	5	6	3

$$
\begin{array}{r}
1011 \\
\times\ 101 \\
\hline
1011 \\
0000 \\
+\ 1011 \\
\hline
110111
\end{array}
$$

1 mark each Ans step=3 Marks
Last Ans =2 Marks

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