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Examination: Odd Semester Examination 2022

Paper Name: Digital Electronics
Time: 3 Hours

Paper Code: BTCSE 304
Maximum Marks: 75

Section A

Note: Attempt ALL the questions

7x5=35

Q. No.	Question	Marks	CO	BL
1.	What is the difference between a combinational circuit and a sequential circuit?	5	CO2, CO4	2
2.	Discuss the working and design constraints of D flipflops. Why D Flipflops are known as data flipflops?	5	CO4	4
3.	Explain and prove the following: a) Absorption Law b) Redundant Literal Law c) Consensus Theorem	5	CO1	6
4.	Explain the working of an 8:1 MUX. Derive its circuit diagram and expression.	5	CO2	6
5.	Explain the working of a Parallel In Parallel Out shift register. How many clock pulses are required to store and retrieve the data?	5	CO4	2
6.	How does Successive Approximation (SAR) ADC work and where is it best used?	5	CO5	3
7.	Explain the working of Field Programmable Gate Arrays.	5	CO5	4

Section B

Note: Attempt any FOUR (4) Questions

(4x10=40)

Q. No.	Question	Marks	CO	BL
1.	a) Explain the working of a 8-bit parallel adder. b) Explain and implement a 2-bit comparator circuit.	10	CO2	3
2.	Explain the working of J-K Master-Slave Flipflop. Why is it used?	10	CO4	5
3.	Design a Mod 6 synchronous counter using T Flipflop.	10	CO4	3
4.	A 4-bit R/2R digital-to-analog (DAC) converter has a reference of 3 volts. For a digital input code of "0110" what would be the equivalent analog output in volts?	10	CO5	4

5.	Using the following K-Maps: a) Find the minimal sum of products expression. Show your groupings. b) Are your solutions unique? If not, list and show the other minimal expressions. ab <table> <tr> <td>cd</td> <td>00</td> <td>01</td> <td>11</td> <td>10</td> </tr> <tr> <td>00</td> <td>X</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>01</td> <td>1</td> <td>0</td> <td>0</td> <td>X</td> </tr> <tr> <td>11</td> <td>0</td> <td>X</td> <td>0</td> <td>1</td> </tr> <tr> <td>10</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> </table> (1) ab <table> <tr> <td>cd</td> <td>00</td> <td>01</td> <td>11</td> <td>10</td> </tr> <tr> <td>00</td> <td>1</td> <td>X</td> <td>0</td> <td>1</td> </tr> <tr> <td>01</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> </tr> <tr> <td>11</td> <td>0</td> <td>0</td> <td>X</td> <td>0</td> </tr> <tr> <td>10</td> <td>X</td> <td>0</td> <td>1</td> <td>1</td> </tr> </table> (2)	cd	00	01	11	10	00	X	0	0	1	01	1	0	0	X	11	0	X	0	1	10	0	0	0	1	cd	00	01	11	10	00	1	X	0	1	01	1	1	1	0	11	0	0	X	0	10	X	0	1	1	10	CO1	5
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6.	Write a short note on any 2 of the following: 1. EPROM 2. Decimal to BCD Encoder 3. Octal to Binary Encoder 4. SRAM	10	CO3	2																																																		

BL : Bloom's Taxonomy Level (1-Remembering, 2-Understanding, 3-Applying, 4- Analysing, 5-Evaluating, 6- Creating)