NARSIMHA REDDY ENGINEERING COLLEGE

UGC AUTONOMOUS INSTITUTION

Maisammaguda (V), Kompally - 500100, Secunderabad, Telangana State, India

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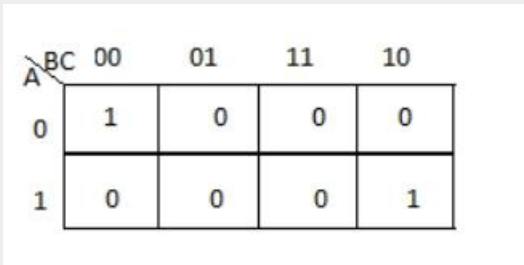Permanently affiliated to JNTUH

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QUESTION BANK:

SHORT QUESTIONS

UNIT-1:

S.NO	QUESTIONS	Blooms Taxonomy Level	CO
1.	Write short notes on binary number systems?	Understand	1
2.	Discuss 1's and 2's complement methods of subtraction?	Understand	1
3.	Discuss octal number system?	Understand	1
4.	Write a short note on five-bit BCD codes?	Understand	1
5.	Explain the specialty of unit –distance code? State where they are used?	Understand	1
6.	Write a short note on error correcting codes?	Understand	1
7.	State De-Morgan theorem?	Knowledge	1
8.	Convert $(4085)_9$ into base-5?	Understand	1
9.	Write the first 20 decimal digits in base 3?	Understand	1
10.	Write the steps involved in unsigned binary subtraction using complements with examples?	Understand	1
11.	Explain the addition of two signed binary number along with examples?	Understand	1
12.	Differentiate between binary code and BCD code?	Understand	1
13.	Write the Axiomatic Definitions of Boolean Algebra?	Understand	1
14.	Design the two graphic symbols for NAND gate?	Understand	1
15.	Design the two graphic symbols for NOR gate?	Understand	1

UNIT-II:

S.NO	QUESTIONS	Blooms Taxonomy Level	CO-PO Mapping
1.	**Write** a table stating all the postulates and theorems of Boolean Algebra that are required for logic minimization?	Understand	2
2.	Explain how do you convert AOI logic to NAND logic?	Understand	2
3.	**Convert** $f(x) = x + y'z$ into canonical form?	Understand	2
4.	**Define** K-map? Name its advantages and disadvantages?	Knowledge	2
5.	**Summarize** the Boolean function $x'yz + x'yz' + xy'z' + xy'z$ using K-map?	Understand	2
6.	**Summarize** the Boolean function $x'yz + x'yz' + xy'z' + xy'z$ without using K-map?	Understand	2
7.	**Explain** the properties of EX-OR gate?	Understand	2
8.	**Solve** the function of fig with AND-OR INVRET implementations? 	Apply	2
9.	**Sketch** the following logic function using k-map and implement it using logic gates? $Y(A,B,C,D) = \sum m(0,1,2,3,4,7,8,9,10,11,12,14)$	Apply	2

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UNIT-III:

1.	**Explain the design procedure for combinational circuits?**	Understand	3
2.	**Explain the design procedure for combinational circuits?**	**Understand**	3
3.	**Design a combinational logic circuit with 3 input variables that will produce logic 1 output when more than one input variables are logic 1?**	Understand	3
4.	**Compose and explain the block diagram of 4-bit decimal adder?**	Understand	3
5.	**Define magnitude comparator?**	Knowledge	3
6.	**Explain** the design procedure for combinational circuits?	Understand	3
7.	**Design** and implement a 8421 Gray code converter?	Understand	3
8.	**Define** magnitude comparator?	Knowledge	3
9	**Define magnitude comparator?**	Knowledge	3
10	**Design** a 4-bit priority encoder?	Understand	3
11	**Differentiate** multiplexer and demultiplexer?	Apply	3
12	**Explain** the working of 8:1 multiplexer?	Understand	3

UNIT IV

1.	**Differentiate** combinational and sequential logic circuits?	Apply	4
2.	**Explain** basic difference between a shift register and counter?	Understand	4
3.	**Illustrate** applications of shift registers?	Apply	4
4.	**Define** bidirectional shift register?	Knowledge	4
5.	**Classify** the basic types of counters?	Understand	4
6.	**Differentiate** the advantages and disadvantages of ripple counters?	Apply	4
7.	**Design** and explain gated latch logic diagram?	Understand	4
8.	**Define** race around condition? How it can be avoided?	Knowledge	4
9.	**Explain** what is a synchronous latch?	Understand	4

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10. **Construct** a latch using universal gates?	Apply	4
11. **Explain** what do you mean a stable state?	Understand	4
12. **Define** a Flip-Flop?	Knowledge	4

UNIT 5

1. **Explain** the block diagram of memory unit?	Understand	5
2. **Explain** in detail about RAM and types of RAM?	Understand	5
3. **Illustrate** the features of a ROM cell?	Apply	5
4. **Explain** in detail about ROM and types of ROM?	Understand	5
5. **Differentiate** static and dynamic RAM?	Apply	5
6. **Explain** what is the use of cache memory?	Understand	5
7. **Explain** PLA with the help of block diagram?	Understand	5
8. **Explain** the advantage of PLA over ROMs?	Understand	5

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LONG ANSWERS:

UNIT 1:

1.	(a) **Solve** the subtraction with the following unsigned binary numbers by ta of the i.100 – 110000 ii. 11010 - 1101. (b) **Construct** a table for 4 -3 -2 -1 weighted code and write 9154 using this code. Write short notes on binary number systems.	Apply	1
2.	**Solve** (3250 - 72532)$_{10}$ using 10's complement?	Apply	1
3.	**Convert** 10101101.0111 to octal equivalent and hexadecimal equivalent?	Understand	1
4.	**Solve** addition and subtraction of (456)8 and (341)8?	Apply	1
5.	**Explain** what do you mean by error detecting and correcting codes?	Understand	1
6.	**State** and prove any 4 Boolean theorems with examples?	Understand	1
7.	**Solve** (a) Perform addition 01100100 + 00011001 (b) Given that (292)$_{10}$ = (1204) $_b$ determines `b'	Apply	1
8.	**Explain** the truth tables of X-OR, NAND and NOR gates?	Understand	1

UNIT 2:

1.	Using Karnaugh map. Solve F(A,B,C,D) = Σ(0,1,2,5,6,7,8,9,10,13,14,15)+d(11,12)	Knowledge	
2.	**Summarize** the Boolean function F(w, x, y, z) = Σ(1, 3, 7, 11, 15)	Understand	
3.	**Summarize** the following Boolean expressions using K-map and implement them using NOR gates: (a) F (A, B, C, D) = AB'C' + AC + A'CD' (b) F (W, X, Y, Z) = W'X'Y'Z' + WXY'Z' + W'X'YZ + WXYZ.	Understand	
4.	**Implement** the Boolean function F = AB + CD + E using NAND gates only?	Understand	
5.	**Implement** the INVERTER gate, OR gate and AND gate using NAND gate, NOR gate?	Understand	
6.	**Summarize** the following Boolean expressions using K-map and implement them using NOR gates: (a) F (A, B, C, D) = AB'C' + AC + A'CD' (b) F (W, X, Y, Z) = W'X'Y'Z' + WXY'Z' + W'X'YZ + WXYZ.	Understand	

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UNIT 3:

1.	**Construct** and explain the working of decimal adder?	Apply	3
2.	**Design 1**-bit comparator using logic gates?	Understand	3
3.	**Design** the operation performed by the following logic circuit with an example. Encoder?	Apply	3
4.	**Construct** 16:1 multiplexer using 8:1 and 2:1 multiplexer?	Apply	3
5.	**Design** and implement a full adder circuit using a 3:8 decoder?	Understand	3

UNIT 4:

1.	**Write** short notes on shift register? Mention its application along with the Serial Transfer in 4-bit shift Registers?	Understand	4
2.	**Design** a Modulo-12 up Synchronous counter Using T-Flip Flops and draw the Circuit diagram?	Understand	4
3.	**Design** a 3-bit ring counter? Discuss how ring counters differ from twisted ring counter?	Understand	4
4.	**Design** a left shift and right shift for the following data 10110101?	Understand	4
5.	**Design** Johnson counter and state its advantages and disadvantages?	Understand	4
6.	**List** the characteristic equations for all Flip-Flops? **Construct** the transition table for the following flip-flops i) SR FF ii) D FF	Understand	4

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UNIT 5:

1.	**Sketch** the PLA program table for the four Boolean functions. Minimize the number of product terms? $A(x,y,z)=\Sigma(0,1,3,5)$ $B(x,y,z)=\Sigma(2,6)$ $C(x,y,z)=\Sigma(1,2,3,5,7)$ $D(x,y,z)=\Sigma(0,1,6)$	Apply	5
2.	**Explain** the DRAM organization of 2M*8 memory chip? **Distinguish** between SRAM and DRAM and draw static RAM cell?	Apply	5
3.	**Solve** the following two Boolean functions using a PLA having 3-inputs,4 product terms and 2 outputs? $F1(A,B,C)=\Sigma(0,1,2,4)$ $F2(A,B,C)=\Sigma(0,5,6,7)$	Apply	5
4.	**Explain** the state reduction and state assignment in designing sequential circuit. Consider one example in the above process?	understand	5
5.	For a 64*8 ROM determine the number of words it contains and size of each word? How many output lines are their for the ROM?	understand	5
6.	Differentiate the PROM, PLA and PLD? **Solve** the following multi Boolean function using PLD? $F_1(a_2, a_1, a_0) =\Sigma m(0,1,3,5)$ $F_2(a_2, a_1, a_0) =\Sigma m(3,5,7)$	Apply	5