Enrolment No._____

NATIONAL FORENSIC SCIENCES UNIVERSITY, DELHI CAMPUS

M.Sc. Forensic Science - Semester - 2 - April-2022

Term Assessment – 1

Subject Code: **Date:**

Subject Name: CTBTCSE S-II P4

Time:45 minutes **Total Marks: 25**

Instructions: Attempt all questions.

Q1. Convert the following as per binary number system:- **2x10=20 marks**

11. $(155)_{10}$ = ( )$_8$
12. $(93)_{10}$ = ( )$_{16}$
13. $(142AF)_{16}$ = ( )$_2$
14. $(1111.101)_2$ = ( )$_{10}$
15. $(541)_8$ = ( )$_2$
16. $(10011011)_2$ = ( )$_{10}$
17. $(54.18)_{10}$ = ( )$_2$
18. $(642)_{10}$ = ( )$_2$
19. $(1011.101)_2$ = ( )$_{10}$
20. $(1001100111)_2$ = ( )$_8$

Q2. Briefly explain the following:

iii. Digital system **2 marks**

iv. Binary storage and registers **3 marks**

421

160 ×2 320

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NATIONAL FORENSIC SCIENCES UNIVERSITY, DELHI CAMPUS

B.Tech-M.Tech Computer Science and Engineering (Cyber Security)

Semester - 2 – May -2022

Mid Sem Exam Question Paper

Subject Code: CTBTCSP4 **Date: 17.05.2022**

Subject Name: Digital Logic Design

Time: 1 hr 30 min **Total Marks: 50**

Instructions: Attempt all questions

Q1. Give the conversions for following numbers:- **(8x2=16)**

i. $(412)_8 = (\ )_{16}$

ii. $(142AF)_{16} = (\ )_2$

iii. $(1111.101)_2 = (\ )_{10}$

iv. $(54.18)_{10} = (\ )_2$

v. $(A2B2C)_{16} = (\ )_8$

vi. $(93)_{10} = (\ )_{16}$

vii. $(1142)_8 = (\ )_2$

viii. $(10011011)_2 = (\ )_{10}$

Q2. Write the sum of following addition equations:- **(4x4=16)**

i. $(25.27)8 + (13.2)8 =$

ii. $(2DE)16 + (567)16 =$

iii. $(10111)2 + (1101)2 =$

iv. $(162)8 + (537)8 =$

Q3. Solve the following Boolean expressions and draw their logic gates:- **(3x6=18)**

i. $F = ABC + (A^{-1}) + AB^{-1}C$

ii. $F = (A^{-1}B^{-1}C^{-1}) + (A^{-1}B^{-1}C) + (A^{-1}C^{-1})$

iii. $F = (A+C)(AD + AD^{-1}) + AC + C$

Seat No.: 2819 Enrollment No.: 102CTBMCS2122

NATIONAL FORENSIC SCIENCES UNIVERSITY

B.Tech.-M.Tech. Computer Science & Engineering (Cyber Security) - Semester II - Aug-2022

Subject Code: CTBTCSE SII P4 **Date: 04/08/2022**

Subject Name: Digital Logic Design

Time: 11:00AM to 2:00PM **Total marks: 100**

Instructions:

1. **Write down answer of each question on separate page.**
2. **Attempt all questions.**
3. **Make suitable assumptions whenever necessary.**
4. **Figures to the right indicate full marks.**

			Marks
Q.1	(a)	State any seven logical operations with their truth tables and standard graphic symbols.	07
	(b)	(i) Convert decimal number 27 to binary number. (ii) Convert $(630.4)_8$ to decimal number.	04
	(c)	Differentiate Boolean algebra and Arithmetic algebra.	03
	(d)	(i) VHDL is strongly typed and case-insensitive language. **True/False** (ii) Verilog is loosely typed and case-sensitive language. **True/False**	02
	(e)	Write a short note on 4-to-1 line multiplexer.	05
Q.2	(a)	What is an encoder? Explain the function 4-to-2-line encoder using the truth table, circuit diagram, and block diagram. OR What is a decoder? Explain the function 2-to-4-line decoder using the truth table, circuit diagram, and block diagram.	07
	(b)	Use 1's complement to perform M – N with the given binary numbers. M = 1010100, N = 1000100	03
	(c)	What are the types of logic-circuit families? Explain each type in detail.	07
	(d)	Give the differences between a combinational circuit and a sequential circuit.	03
	(e)	Draw the circuit diagram of the S-R flipflop and explain its operation either with the help of the state table or excitation table.	06
Q.3	(a)	(i) Find the complement of given function: f = AB + A'B' (ii) Define the term 'Literal.'	02
	(b)	Draw the truth table, k-map, and logic circuit for half adder. OR What is a hardware description language? Differentiate VHDL and Verilog.	05
	(c)	Simplify the given Boolean function using k-map: $F(W, X, Y, Z) = \Sigma m(1, 3, 4, 6, 9, 11, 12, 14)$	03
	(d)	What is a full adder? Draw the truth table, k-map, and logic circuit implementation for the full adder.	07
	(e)	(i) The operation speed of an asynchronous sequential circuit is usually slower than that of a synchronous sequential circuit. **True/False**	04

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Q.3	(e)	(ii) A combinational logic circuit always contains a feedback connection back to the input. **True/False** (iii) The logical operation 'Complement' is done using _____ Gate. (iv) What is the full form of CMOS?	
Q.4	(a)	What is the working principle of a digital counter? Explain any one counter in detail with block diagram.	06
		OR	
	(a)	List the types of shift registers according to the mode of operation. Explain any one type with its block diagram.	
	(b)	Differentiate Static Random Access Memory and Dynamic Access Memory.	02
	(c)	Simplify the given Boolean expression using Boolean algebra: F(A, B, C) = (A+B)(A+C)	03
	(d)	What is the full form of ROM? Draw the logic diagram of 32 X 8 ROM.	03
		OR	
	(d)	Draw the general block diagram for RAM and list the types of RAM.	
	(e)	Write the full forms of PROM and EPROM. What is the basic difference between these two?	03
	(f)	Describe any three data types of VHDL or Verilog.	03
	(g)	Explain SOP and POS expressions using suitable examples.	04
Q.5	(a)	Write a short note on memory decoding.	04
		OR	
	(a)	Draw the circuit diagram of the D flipflop and explain its operation either with the help of state table or excitation table.	
	(b)	How are the latches and flip-flops different?	02
	(c)	(i) What is the functional property of an XOR gate? (ii) How many inputs are there in a NOT gate?	02