International Institute of Information Technology, Hyderabad

(Deemed to be University)

EC2.101 – Digital Systems and Microcontrollers – Monsoon

Quiz 1: Set D

Max. Time: 30 min **Date: 28th August, 2023** **Max. Marks: 40**

All questions have ONE correct answer. Answers to be marked on the question paper itself
+2 for correct answer, -1 for incorrect.
NO CALCULATORS ALLOWED

Name:_____ **Roll No:** _____

Q1. Convert the number: $(BCD)_{16}$ into decimal
a. 3023 b. 3903 c. 129 d. 3021

Q2. Signed 2's complement representation system is popular because
a. It is simple to understand b. '1' in MSB represents negative numbers
c. Arithmetic is simpler d. All of the above

Q3. Which of the following numbers will be a perfect square in any base r (>2)?
a. $(121)_r$ b. $(64)_r$ c. $(101)_r$ d. $(1000)_r$

Q4. How is the binary number 1011010 expressed in octal?
a. 132 b. 125 c. 72 d. 54

Q5. What is the 9's complement of the decimal number 356 in four digits?
a. 643 b. 9643 c. 6431 d. 6430

Q6. In Boolean algebra, what does the Consensus Theorem state?
a. AB + A'C + BC = AB + A'C b. AB + A'C + A'B' = A + BC'
c. A'B + AC +B'C = A'B + B'C d. A'B + A'C + BC = A'B + B'C

Q7. What is the weighted value of the least significant bit in a binary number?
a. 1 b. 2 c. 4 d. It varies with the number of bits

Q8. What is $(10101)_2$ divided by $(101)_2$?
a. $(8)_{10}$ b. $(6)_{10}$ c. $(101)_2$ d. $(11)_2$

Q9. How many more bits are required to represent $(53)_{10}$ in BCD compared to binary?
a. 8 b. 2 c. 4 d. 6

Q10. A 3-variable function F(x,y,z) has minterms m_6 and m_7. What is the function?
a. yz b. xz c. xy d. All the above

Q11. A 3-variable function F(x,y,z) has maxterms M_0 and M_1. What is the function?
a. (x+y) b. (y+z) c. (x+y+z) d. xy

Q12. In 1's complement subtraction, if an extra carry is obtained then
a. The result is negative b. It is discarded
c. There is an overflow d. It is added to the sum

Q13. Assume that we are encoding text characters as 8-bit binary numbers. How many bits will it take to transmit the text: “10001010”?

a. 8 b. 64 c. 128 d. 32

Q14. What is the representation for 4-bit 2’s complement binary number $(1011)_2$ in 2-digit signed 9’s complement decimal number?

a. 94 b. 91 c. 95 d. 05

Q15. The expression $xy + xyz' + yz + x'y$ simplifies to:

a. xy b. xz c. y d. $xy + yz + x'y$

Q16. The expression $x(x' + y)$ is equivalent to:

a. xy b. $xy(x + x')$ c. $xy + xyx'$ d. All the above

Q17. Which function answers the question: (is x=y?)?

a. XOR b. Inhibition c. Implication d. XNOR

Q18. Which of the following is a NOT property of a valid BCD code?

a. Operations such as addition can be performed with BCD codes
b. It represents each decimal digit with a unique 4-bit binary pattern
c. There are no representations for numbers 10 to 15
d. BCD is different from binary equivalent of the decimal number

Q19. Convert the number: $(7.77)_8$ into hexadecimal

a. 7.AB b. 7.FC c. 7.77 d. 7.9C

Q20. How many numbers can be represented using 32-bit floating point numbers (IEEE 754)?

a. 2^32 b. 2^256 c. 2^127 d. 2^128

Rough work