

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 $(\overset{(11001)}{\cancel{10101}})_2$ 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