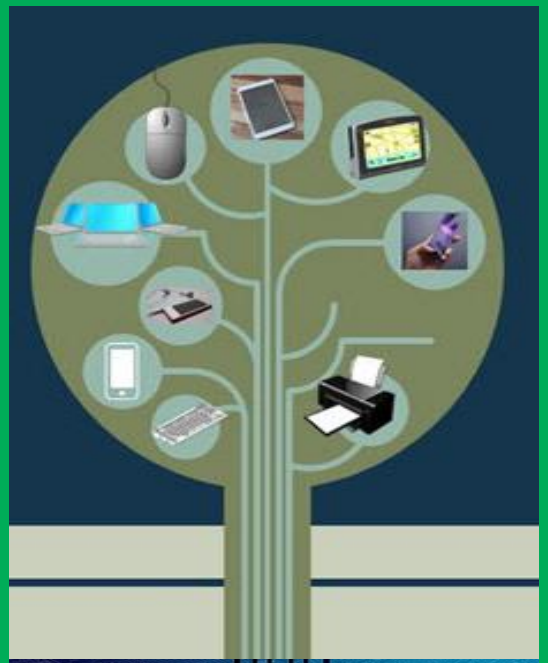
UNIVERSITY of SAN CARLOS
SCIENTIA • VIRTUS • DEVOTIO

DCISM
DEPARTMENT OF COMPUTER, INFORMATION SCIENCES AND MATHEMATICS



CIS 2202

DIGITAL LOGIC DESIGN AND DIGITAL COMPUTER CIRCUITS

PRACTICE PROBLEMS:

NUMBER SYSTEMS ARITHMETIC

PRACTICE PROBLEM 1

Given:

$(10101)_2 - (10010110)_2$

Task:

Using 2's Complement Method, find the difference of the signed binary numbers given above in 10-bit magnitude. No need to obtain the familiar form of the result. Show the complete details of the solution.

Answer: $\mathbf{(11\ 0111\ 1111)_2}$

PRACTICE PROBLEM 2

Given:

$(101110.01)_2$ - $(110101.11)_2$

Tasks:

a) Find the difference of the two signed binary numbers given above using 2's Complement Method. Obtain the familiar form of the result. Show the complete details of the solution.

b) Compute the decimal number equivalent of the given signed numbers and their difference. Show the complete details of the solution.

Answers: a) $(111000.10)_2$ and $(-000111.10)_2$; b) $(-7.5)_{10}$

PRACTICE PROBLEM 3

Given:

$(+45)_{10} - (-17)_{8}$

Task:

Find the result of the operation performed on the two signed numbers above using 2's Complement Method in 8-bit magnitude. Show the complete details of the solution.

Answer: $(0011\ 1100)_2$

PRACTICE PROBLEM 4

Given:

$$(EB)_{16} \times (21)_{8}$$

Tasks:

a) Calculate the product of the unsigned numbers above and express the final answer in hexadecimal number. Show the complete details of the solution.

b) Calculate the product of the unsigned numbers above and express the final answer in octal number. Show the complete details of the solution.

Answers: a) $(F9B)_{16}$; b) $(7633)_{8}$

PRACTICE PROBLEM 5

Given:

$$(CA8)_{16} \div (1010)_2$$

Task:

Determine the quotient of the unsigned numbers given above and express the final answer in decimal number system. Show the complete details of the solution.

Answer: $(324)_{10}$

PRACTICE PROBLEM 6

Given:

$$(2C)_{16} \times (41)_8 - (BA)_{16}$$

Task:

Calculate the result of the operations given above using 2's Complement Method in 12-bit magnitude. Show the complete details of the solution.

Answer: $\mathbf{(0100\ 1111\ 0010)_2}$

PRACTICE PROBLEM 7

Given:

$$(11011110)_2 - (1FE)_{16} \times (12)_8 / 2_{10}$$

Task:

Calculate the result of the operations performed on the signed numbers given above using 2's Complement Method in 16-bit magnitude. No need to obtain the familiar form of the result. Show the complete details of the solution.

Answer: $\mathbf{(1111\ 0110\ 1110\ 1000)_2}$

PRACTICE PROBLEM 8

Given:

$(FAD:BED)_{16}$

Task:

Determine the octal number equivalent of the given number format shown above. Show the complete details of the solution.

Answer: $\mathbf{(7655:5755)_8}$

PRACTICE PROBLEM 9

Given:

$(143\text{-}526\text{-}245)_8$

Task:

Determine the hexadecimal number equivalent of the given number format shown above. Show the complete details of the solution.

Answer: $\mathbf{(63\text{-}156\text{-}A5)_{16}}$

PRACTICE PROBLEM 10

Given:

$(192.168.25.15)_{10}$

Tasks:

a) Determine the octal number equivalent of the given number format shown above. Show the complete details of the solution.

b) Determine the hexadecimal number equivalent of the given number format shown above. Show the complete details of the solution.

Answers: a) $(300.250.31.17)_8$; b) $(C0.A8.19.F)_{16}$

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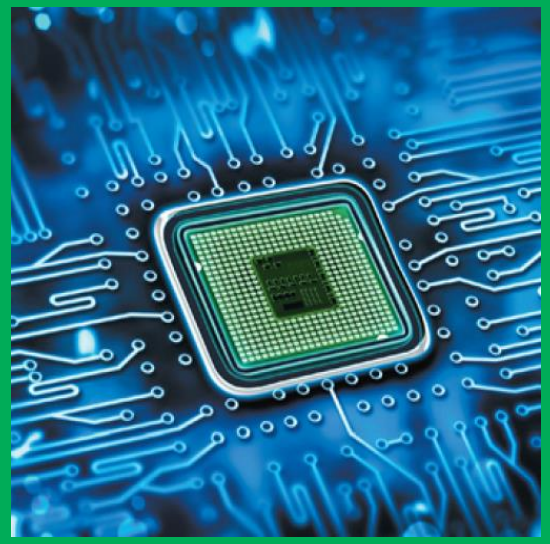

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THANK YOU!