Section Number Systems

- **P17**

For the subtraction of unsigned decimal number using 10's complement of the subtrahend, we first take the 10's complement of subtrahend, then add the result with the minuend.

Case I: If there is an end carry, just discard it and obtain answer from the result obtained by the addition without the end carry.

Case II: If there is no end carry, the final answer will be the negative of 10's complement of the result obtained by the addition.

- **P18**

For the subtraction of unsigned binary number using 2's complement of the subtrahend, we first take the 2's complement of subtrahend, then add the result with the minuend.

Case I: If there is an end carry, just discard it and obtain answer from the result obtained by the addition without the end carry.

Case II: If there is no end carry, the final answer will be the negative of 2's complement of the result obtained by the addition.

- **P19**

(a)

The two numbers are positive.

Express the numbers in five digits and perform the addition.

$$\begin{aligned}(+9286)+(+0801) &= (09286)+(00801)\\ &= 010087\end{aligned}$$

Here, the most significant bit of the result indicates sign (the most significant bit is 0 and hence the result is positive) and remaining represents the magnitude of the result (the magnitude of the result is 100087).

Thus, the result of the operation is $\boxed{010087}$.

- **P20**

In a signed binary number system, a positive number is represented by "0" in the leftmost position and a negative number is represented by "1" in the leftmost position.

Convert the decimal number $+49$ into signed-magnitude binary representation by appending "0" in the leftmost bit position followed by other zero(s) to make the number of digits enough to accommodate the number.

In this case, append two "zeros" so that the leftmost bit "0" make the number positive and one "0" to make overall number of digits equal to 8.

- **P21**

The signed magnitude format of decimal numbers represented as follows:

$(+9742)_{10}$ and $(+641)_{10}$

In case of decimal numbers, 0-indicates for positive sign and 9-indicates for negative sign. The sign bit is stored in the MSB (most-significant-bit).

The five-digit and a sign representation of $(+9742)_{10}$ is,

$$(+9742)_{10} = (\mathbf{0}09742)_{10}$$

The five-digit and a sign representation of $(+641)_{10}$ is,

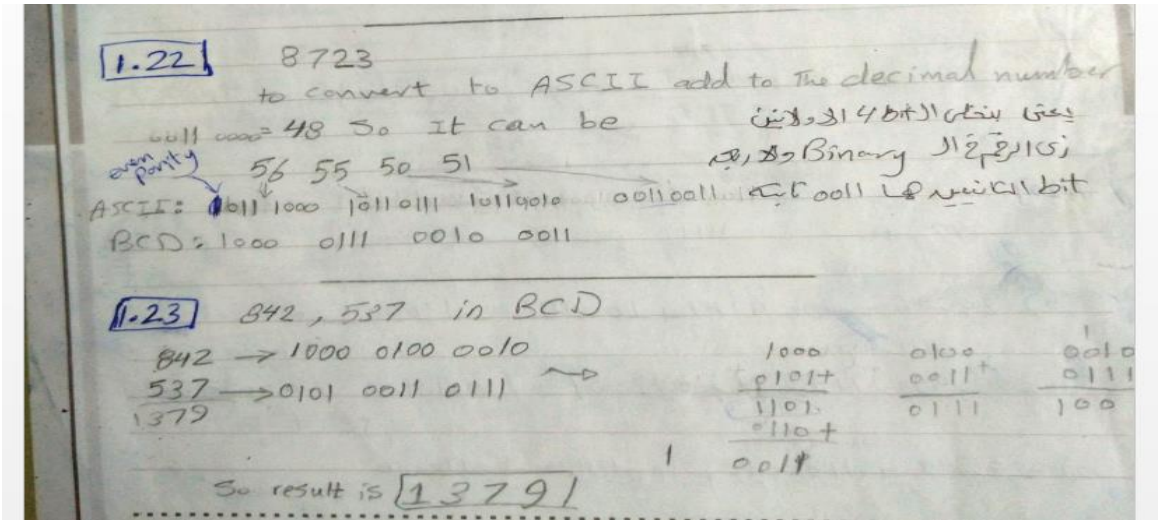
$$(+641)_{10} = (\mathbf{0}00641)_{10}$$

- **P22**

Convert the decimal number into Binary Coded Decimal (BCD) form by replacing each digit of the number by its equivalent 4-bit binary digits.

Table 1 Conversion of decimal number 6514 into BCD

Decimal	BCD
6514	0110 0101 0001 0100



- **P23**

For the BCD addition of two unsigned decimal numbers, we follow the procedures as follows:

i. First convert the two numbers into BCD forms. Then we perform normal binary addition operation by adding each digit.

ii. If the sum is less or equal to decimal 9 or binary 1001, then the sum is the final answer.

iii. If the sum is equal to decimal 10 or binary 1010 or greater then we add decimal 6 or binary 0110 to the sum to get the correct BCD sum.

iv. If the sum includes a carry (this happens when the sum exceeds decimal 15), then add binary 0110 to the sum to get the correct BDC sum.

v. The carry of a BCD sum is added to the next pair of digits.

vi. The final answer is the combination of all sums of each BCD pair.

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