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A). Sorting Strings Using ASCII

To understand how a computer sorts strings using ASCII, it's important to know that ASCII assigns numeric values to characters. Here is a brief overview of the ASCII values for relevant characters:

- Uppercase A-Z: 65 to 90

- Numbers 0-9: 48 to 57

i. Sorting the string "ADEC":

- ASCII values:

    - A = 65

    - D = 68

    - E = 69

    - C = 67

- Sorted order based on ASCII values: **A, C, D, E**

Thus, the sorted order of **"ADEC"** is **"ACDE"**.

ii. Sorting the string "214":

- ASCII values:

    - 2 = 50

    - 1 = 49

    - 4 = 52

- Sorted order based on ASCII values: **1, 2, 4**

Thus, the sorted order of **"214"** is **"124"**.

B). Decimal Equivalent of Binary Numbers

To convert binary numbers to decimal, we multiply each bit by 2^n, where n is the position of the bit from the right (starting at 0).

i. For binary number 10011101:

- Calculation:
    - $1 \times 2^7 = 128$
    - $0 \times 2^6 = 0$
    - $0 \times 2^5 = 0$
    - $1 \times 2^4 = 16$
    - $1 \times 2^3 = 8$
    - $0 \times 2^2 = 0$
    - $1 \times 2^1 = 2$
    - $1 \times 2^0 = 1$

Adding these values together:

$128 + 0 + 0 + 16 + 8 + 0 + 2 + 1 = 155$

So, the decimal equivalent of **10011101** is **155**.

ii. For binary number 100101:

- Calculation:
    - $1 \times 2^5 = 32$
    - $0 \times 2^4 = 0$
    - $0 \times 2^3 = 0$
    - $1 \times 2^2 = 4$
    - $0 \times 2^1 = 0$
    - $1 \times 2^0 = 1$

Adding these values together:

$32 + 0 + 0 + 4 + 0 + 1 = 37$

So, the decimal equivalent of **100101** is **37**.

EBCDIC Coding for the Word "NETQWORK"

EBCDIC (Extended Binary Coded Decimal Interchange Code) is often used in mainframes and represents characters differently than ASCII. Below is the hexadecimal representation for each character in "NETQWORK":

- N = C5

- E = C9

- T = C4

- Q = C7

- W = C5

- O = C3

- R = C2

- K = C6

Full hexadecimal representation:

- NETQWORK in EBCDIC: **C5 C9 C4 C7 C5 C3 C2 C6**

Byte Requirement

Each character in EBCDIC is represented by 1 byte.
Total bytes required: 8 characters = **8 bytes**.

In summary, here's what we have:

- Sorted strings:

    - "ADEC" → "ACDE"

    - "214" → "124"

- Decimal equivalents:

    - 10011101 → **155**

    - 100101 → **37**

- EBCDIC representation for "NETQWORK": **C5 C9 C4 C7 C5 C3 C2 C6** (8 bytes total).