

Topic 1: Binary, Decimal Conversion

Chapter 1: Number Systems (Detailed) · Topic 1

Key Concept

Binary numbers use only two digits, 0 and 1, with each position representing a power of 2 (1, 2, 4, 8, 16, and so on).

To convert binary to decimal, we multiply each digit by its place value (power of 2) and add the results together.

For example, binary 101 converts to decimal: $(1 \times 4) + (0 \times 2) + (1 \times 1) = 4 + 0 + 1 = 5$.

To convert decimal to binary, we repeatedly divide by 2 and track the remainders, then read them in reverse order.

Quick Revision Notes

- Binary numbers use only 0 and 1.
- Each position represents a power of 2.
- Convert binary to decimal by multiplying and adding place values.
- Binary 101 = $(1 \times 4) + (0 \times 2) + (1 \times 1) = 5$.
- Convert decimal to binary by dividing by 2 repeatedly.
- Track remainders and read in reverse.
- Computers use binary internally.
- Conversion connects human and computer number systems.

Practice Questions

- 1 Convert binary 111 to decimal.
- 2 Convert decimal 6 to binary.
- 3 Convert binary 1000 to decimal.
- 4 Discuss why computers use binary internally.
- 5 Practice converting three binary numbers to decimal.
- 6 Explain place value in binary numbers.