

Binary Numbers Advanced Level ANSWERS

Multiple choice questions

Question 1	Question 2	Question 3
<p>What is the primary reason why computers use the binary system?</p>	<p>How does the binary system represent numbers compared to the decimal system?</p>	<p>Why do computers use a fixed number of bits to represent numbers, even if fewer bits are needed?</p>
<p>A. The binary system is the most efficient way to represent numbers, requiring the least amount of memory.</p> <p>B. The binary system is the only system that can be used to represent information using electrical signals.</p> <p>C. The binary system is easily implemented using logic gates, which are electronic circuits that can be either open or closed, mirroring the binary digits 1 and 0.</p> <p>D. The binary system is the most intuitive system for humans to understand and use.</p>	<p>A. The binary system uses powers of ten, while the decimal system uses powers of Two.</p> <p>B. The binary system uses only two digits, 0 and 1, while the decimal system uses ten digits, 0-9.</p> <p>C. The binary system uses a fixed number of bits to represent numbers, while the decimal system uses a variable number of digits.</p> <p>D. The binary system uses a combination of letters and numbers, while the decimal system uses only numbers.</p>	<p>A. This is a standard practice that ensures all computers use the same representation for numbers.</p> <p>B. Using a fixed number of bits simplifies the process of storing and processing numbers.</p> <p>C. This allows computers to represent larger numbers more efficiently.</p> <p>D. This is a legacy practice from early computers that has not been updated.</p>



Short-answer questions

1. What is the significance of understanding the binary number system for individuals interested in computer science or technology?

Understanding binary is essential because it's the foundation of all computer operations. It helps individuals understand how data is stored, processed, and transmitted, making it easier to learn programming, hardware design, or system architecture.

2. How does the binary system's use of powers of two differ from the decimal system's use of powers of ten?

The binary system increases place value by powers of 2 ($2^0, 2^1, 2^2, 2^3, 2^4, \dots$ – so 1, 2, 4, 8, 16...), while the decimal system increases place value by powers of 10 ($10^0, 10^1, 10^2, 10^3, 10^4, \dots$ – so 1, 10, 100, 1000...). This difference reflects the number of digits each system uses; 2 digits in binary (0 and 1) vs 10 digits in decimal (0 - 9).

Open-ended questions

1. Computers use binary code to represent information. Consider how you use technology in your daily life. How does understanding the binary system change your perspective on the way you interact with computers and other devices?

Sample Answer:

Knowing that everything I see on a screen like texts, images, apps, is built from just 0s and 1s makes me appreciate how powerful and complex computers really are. It helps me understand that even simple actions like clicking a button involve many layers of binary operations happening behind the scenes.

2. Understanding the binary system is very important for anyone interested in computer science or technology. What are your own interests and aspirations? How might understanding the binary system help you achieve your goals?

Sample answer:

I'm interested in designing video games and apps. Understanding binary will help me learn how computers process instructions and manage memory. It's the first step towards writing efficient code and creating programs that work well on different devices.