

Chapter 01 – Computer Science (Class 10)

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Q2. Short Response Questions with Answers

1. What is the significance of the Most Significant Bit (MSB) in signed binary numbers?

Ans: The **Most Significant Bit (MSB)** in signed binary numbers indicates the **sign** of the number:

- **0** means the number is **positive**
- **1** means the number is **negative**

It helps the computer distinguish between positive and negative values.

2. What is a binary digit, and why is it fundamental in computer systems?

Ans: A **binary digit (bit)** is the smallest unit of data in a computer and can be either **0 or 1**.

It is fundamental because computers use bits to represent and process all information, matching their two-state electronic circuits (ON/OFF).

3. Why are binary numbers more efficient for computer calculations than decimal numbers?

Ans: Binary numbers are easier for computers to process using digital circuits with only two states (0 and 1).

4. How do ASCII and Unicode differ in character representation?

Ans: ASCII uses 7 or 8 bits to represent characters, while Unicode uses up to 32 bits, supporting more global languages.

Feature	ASCII	Unicode
Full Form	American Standard Code for Information Interchange	Universal Character Encoding Standard
Bit Size	7 bits (128 characters)	Variable (8, 16, or 32 bits) – supports over 1.1 million characters
Character Range	0–127	Covers characters from almost all world languages

Feature	ASCII	Unicode
Language Support	Only English (basic Latin characters)	Multilingual: supports symbols, emojis, and scripts like Chinese, Arabic, Hindi, etc.
Examples	A = 65, a = 97, @ = 64	A = U+0041, 'र' = U+0939, '你' = U+4F60
Usage	Early computers, simple text files	Modern systems, websites, mobile apps

5. What is the importance of positional value in number systems? Give two examples.

Ans: Positional value determines a digit's weight based on its position. Example:

- In 345, '5' is in the unit's place
- In binary 1010, the second 1 is in the 8's place.

Positions (from right to left):

- $0 \rightarrow 2^0 = 1$ place
- $1 \rightarrow 2^1 = 2$ place
- $0 \rightarrow 2^2 = 4$ place
- $1 \rightarrow 2^3 = 8$ place

6. What is the process to convert a binary number to its hexadecimal equivalent?

Ans: Group the binary digits into sets of 4 (from right to left), then convert each group to its hex value.

7. What is the purpose of machine code in computer operations?

Ans: Machine code is directly executed by the CPU to perform instructions in binary form.

8. Why coding scheme is used in computers? Give three reasons.

Ans: Coding schemes represent text in binary form for:

- Data storage
- Data transmission
- Text processing

9. State five differences between a process and a thread.

Ans:

- A process is independent; a thread is part of a process
 - Processes use more resources
 - Threads share memory; processes do not
 - Processes have separate address spaces
 - Threads are faster to create than processes
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10. What is memory management and how does it work in an operating system?

Ans: Memory management allocates and deallocates memory to programs efficiently, avoiding memory conflicts and ensuring smooth execution.

11. What is a real-time operating system and where is it commonly used?

Ans: RTOS responds to inputs instantly. It is used in critical systems like medical devices, air traffic control, and industrial automation.

12. Differentiate between multiprogramming and multitasking operating systems.

Ans:

- Multiprogramming runs multiple programs one by one
 - Multitasking allows programs to run seemingly at the same time.
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13. List two pros and two cons of on-premises hosting.

Ans:

Pros:

- Full control over data
- More customizable

Cons:

- High maintenance cost
 - Requires in-house IT staff
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14. What is an application patch? Give key functions of it.

Ans: An application patch fixes bugs, adds features, or improves performance and security in software.

15. Differentiate between offline and online applications. Give one example of each.

Ans:

- **Offline app:** Works without the internet (e.g., MS Word)
 - **Online app:** Needs the internet to work (e.g., Google Docs)
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The End

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