1. In binary search, the array must be:
   1. **Sorted in ascending order**
   2. Sorted in descending order
   3. Unsorted
   4. None of the above
2. What is the time complexity of binary search?
   1. O(1)
   2. **O(log n)**
   3. O(n)
   4. O(n^2)
3. Binary search is a:
   1. Recursive algorithm
   2. Iterative algorithm
   3. **Both recursive and iterative algorithm**
   4. None of the above
4. Binary search can be applied to which of the following data structures?
   1. Array
   2. Linked list
   3. Binary search tree
   4. **All of the above**
5. Binary search is efficient for:
   1. **Large arrays**
   2. Small arrays
   3. Arrays with duplicate elements
   4. Arrays with random elements
6. The first step in binary search is to:
   1. Compare the middle element with the target element
   2. **Divide the array into two halves**
   3. Check if the array is sorted
   4. None of the above
7. What is the purpose of binary search?
   1. To find the maximum element in an array
   2. To find the minimum element in an array
   3. **To find a specific element in a sorted array**
   4. To sort an array
8. The binary search algorithm follows a \_\_\_\_\_\_\_\_ approach.
   1. **Divide and conquer**
   2. Greedy
   3. Brute force
   4. Randomized
9. Which of the following is a prerequisite for binary search?
   1. **The array must be sorted**
   2. The array must contain unique elements
   3. The array must be of even length
   4. The array must be in descending order
10. Binary search can be used to find:
    1. The sum of all elements in an array
    2. The average of all elements in an array
    3. **The median of an array**
    4. The mode of an array
11. What is the worst-case time complexity of binary search?
    1. O(1)
    2. **O(log n)**
    3. O(n)
    4. O(n^2)
12. Binary search can be used to find the:
    1. Maximum element in an array
    2. Minimum element in an array
    3. **Both maximum and minimum elements in an array**
    4. None of the above
13. Which of the following is true about binary search?
    1. It compares elements in a linear manner
    2. It guarantees finding the element in the array
    3. **It works only for sorted arrays**
    4. It has a time complexity of O(n)
14. In binary search, the search range is updated by:
    1. Incrementing the low index and decrementing the high index
    2. Incrementing both the low and high indexes
    3. **Dividing the search range in half**
    4. Randomly selecting a new search range
15. Binary search is a suitable algorithm for which of the following scenarios?
    1. Finding all occurrences of an element in an unsorted array
    2. Searching for a specific substring in a string
    3. Determining the frequency of elements in an array
    4. **Finding the square root of a number**
16. Binary search can be applied to a linked list by:
    1. **Converting the linked list to an array first**
    2. Traversing the linked list using a linear search
    3. Modifying the linked list structure to support binary search
    4. None of the above
17. Binary search is based on the principle of:
    1. Linear interpolation
    2. Exponential growth
    3. **Halving the search space**
    4. Random sampling
18. The mid element in binary search is calculated as:
    1. **(low + high) / 2**
    2. (low - high) / 2
    3. (low + high) \* 2
    4. (low - high) \* 2
19. Binary search can be used to solve which of the following problems efficiently?
    1. Sorting a linked list
    2. Finding the kth largest element in an unsorted array
    3. Finding the longest increasing subsequence in an array
    4. **All of the above**
20. The number of iterations required for binary search depends on:
    1. **The size of the array**
    2. The value being searched
    3. The position of the value in the array
    4. The search algorithm used
21. Binary search is an example of:
    1. Linear search
    2. **Divide and conquer algorithm**
    3. Brute force algorithm
    4. Greedy algorithm
22. Which of the following is an advantage of binary search over linear search?
    1. Binary search works on unsorted arrays
    2. **Binary search has a lower time complexity**
    3. Binary search can be applied to linked lists
    4. Binary search guarantees finding the element
23. In binary search, the worst-case scenario occurs when:
    1. **The element is not present in the array**
    2. The element is in the middle of the array
    3. The array contains duplicate elements
    4. The array is sorted indescending order
24. Binary search is NOT suitable for which of the following scenarios?
    1. Searching for a word in a dictionary
    2. **Finding the maximum value in an unsorted array**
    3. Determining if an element exists in a sorted array
    4. Finding the closest value to a given target in a sorted array
25. The condition for terminating binary search is:
    1. The element is found
    2. The entire array has been searched
    3. **The low index becomes greater than the high index**
    4. The target value is equal to the mid element
26. The average-case time complexity of binary search is:
    1. O(1)
    2. **O(log n)**
    3. O(n)
    4. O(n^2)
27. Binary search is a suitable algorithm for finding:
    1. The maximum element in an unsorted array
    2. The minimum element in an unsorted array
    3. **The longest subsequence in an array**
    4. The sum of all elements in an array
28. Which of the following statements about binary search is TRUE?
    1. It can be used to find the maximum element in an unsorted array
    2. It guarantees finding the element in the array
    3. **It requires the elements to be distinct in the array**
    4. It works only for arrays of even length
29. Binary search can be used to find the:
    1. Mode of an array
    2. Range of elements in an array
    3. Sum of all elements in an array
    4. **First occurrence of an element in an array**
30. Which of the following is NOT a disadvantage of binary search?
    1. It requires the array to be sorted
    2. It cannot be applied to linked lists
    3. **It has a higher time complexity than linear search**
    4. It requires random access to array elements
31. Binary search can be used to solve which of the following problems efficiently?
    1. Finding the longest common subsequence of two strings
    2. **Finding the maximum sum subarray in an array**
    3. Finding the factorial of a number
    4. All of the above
32. The best-case time complexity of binary search is:
    1. **O(1)**
    2. O(log n)
    3. O(n)
    4. O(n^2)
33. In binary search, the mid element is compared with the target element to determine:
    1. If the element is present in the array
    2. **If the search range should be updated**
    3. If the element is the maximum element in the array
    4. If the element is the target element