

Walmart CodeHers

Previous Year Questions

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- 1. Choose the option which is not an example of a control statement.**
 - a. The Loop
 - b. The process
 - c. The Sequential
 - d. The decision

- 2. Catalan numbers can be implemented in several ways, which of these is the best way in terms of time complexity?**
 - a. Dynamic Programming
 - b. Recursion
 - c. Binomial coefficients
 - d. Equal complexity in every case

- 3. Which of the following are the two main characteristics used to define the efficiency of an algorithm?**
 - a. Time and space
 - b. Data and time
 - c. Processor and memory
 - d. Complexity and capacity

- 4. An array can be defined as:**
 - a. A data structure which stores heterogeneous data elements
 - b. A data structure which stores homogeneous data elements
 - c. A data structure which shows hierarchical behaviour
 - d. All of the above

- 5. While inserting in a circular queue, which of the following is the correct way to increment the rear value?**
 - a. rear =rear+1
 - b. (rear+1) % max
 - c. (rear % max) + 1
 - d. None of the above

- 6. Which of the following is the application of stack?**
 - a. Data Transfer between two asynchronous process
 - b. Simulation of limited resource allocation
 - c. Compiler Syntax Analyzer
 - d. Load balancing

7. Which data structure is considered best to find maximum value from a huge collection of data?

- a. Sorted array
- b. Max heap
- c. Min heap
- d. Binary search tree

8. A complete n-ary tree contains 14 internal nodes and 29 leaf nodes. What is the value of n?

- a. 2
- b. 3
- c. 4
- d. 5

9. Find the time complexity of sorting n integers using Radix sort. Each integer has d digits and the digit is in the set of (1,2...,s).

- a. $O(s(n+d))$
- b. $O(d(n+s))$
- c. $O((n+s)\lg d)$
- d. $O((n+d)\lg s)$

10. Choose the incorrect property of a binary tree:

- a. For every level 'i' ($i \geq 0$), there are no more than 2^i nodes on that level.
- b. In Binary tree where every node has 0 or 2 children, the number of leaf nodes is always one more than nodes with two children.
- c. If the tree has L levels, then the maximum nodes present can be $2^L - 1$.
- d. If binary tree has N nodes, the number of levels of that tree is at least $\lceil \log(N+1) \rceil$

11. Calculate the result of the following prefix expression: +, -, *, 8, 4, /, 6, 2, 5

- a. 32
- b. 34
- c. 5
- d. 42

12. Suppose a word is reversed using stack algorithm. What will be the number of stacks required to perform such task?

- a. 1
- b. 2
- c. 3
- d. None of the above

13. If you have n distinct keys, how many distinct binary search trees can be created?

- a. 2^n !
- b. $(2n)! / (n)!$
- c. $(n)! / (n-1)!$
- d. $(2n)! / (n! * (n-1)!)$

14. A single try block must be followed by which of these?

- a. finally
- b. catch
- c. Both finally and catch
- d. None of the above

15. Which of the following methods is used to avoid serialization of new class whose super class already implements Serialization?

- a. writeObject()
- b. readWriteObject()
- c. writeReadObject()
- d. unSerializaedObject()

16. A table has fields F1, F2, F3, F4, and F5, with the following functional dependencies: F1->F3 F2->F4 (F1,F2)->F5 In terms of normalization, this table is in?

- a. 1NF
- b. 2NF
- c. 3NF
- d. None of the above

17. Which is a bottom-up approach to database design that design by examining the relationship between attributes?

- a. Functional dependency
- b. Database modeling
- c. Normalization
- d. Decomposition

18. What are composite indexes?

- a. Are those which are composed by database for its internal use
- b. A composite index is a combination of index on 2 or more columns
- c. Composite index can never be created
- d. None of the above

19. If a transaction is performed in a database and committed, the changes are taken to the previous state of transaction by

- a. Flashback
- b. Rollback
- c. Both Flashback and Rollback
- d. Cannot be done

20. A _____ indicates an absent value that may exist but be unknown or that may not exist at all.

- a. Empty tuple
- b. New value
- c. Null value
- d. Old value

21. Here which of the following displays the unique values of the column?

SELECT _____ dept_name

FROM instructor;

- a. All
- b. From
- c. Distinct
- d. Name

22. Let R(A,B,C,D,E,P,G) be a relational schema in which the following FDs are known to hold:

AB->CD

DE->P

C->E

P->C

B->G

The relation schema R is?

- a. In BCNF
- b. In 3NF, but not in BCNF
- c. In 2NF, but not in 3NF
- d. Not in 2NF

23. Which of the following is a basic form of grant statement?

- a. GRANT 'privilege list' ON 'relation name or view name' TO 'user/role list';
- b. GRANT 'privilege list' ON 'user/role list' TO 'relation name or view name';
- c. GRANT 'privilege list' TO 'user/role list'
- d. GRANT 'privilege list' ON 'relation name or view name' ON 'user/role list';

24. Class (course id, title, dept name, credits, sec id, semester, YEAR, building, room NUMBER, capacity, TIME slot id)

The SET OF functional dependencies that we require TO hold ON class are:

course id->title, dept name, credits

building, room number->capacity

course id, sec id, semester, year->building, room NUMBER, TIME slot id

A candidate KEY FOR this schema IS {course id, sec id, semester, YEAR}

Considering the above conditions, which of the following relation holds?

- a. Course id-> title, dept name, credits
- b. Title-> dept name, credits
- c. Dept name-> credits
- d. Cannot be determined

25. Convert the given Infix Expression $((10/2) + 7) - (3 + (5 - 2))$ to a Prefix Expression

- a. / + 10 2 7 - + - 3 5 2
- b. - / + 10 2 7 + - 3 5 2
- c. - 10 / 2 + 7 3 + 5 - 2
- d. - + / 10 2 7 + 3 - 5 2

26. Rachel is learning the concepts of arrays in java. She was curious to know where the array object reference is stored. Can you determine the correct answer for the same?

- a. Stack
- b. Heap
- c. JVM
- d. JRE

27. Suppose you want to specify additional directories in Numpy for a machine learning algorithm then which of the following environment variables will you choose?

- a. pythonpath
- b. numpath
- c. algopath
- d. pythonspace

28. Consider that you have implemented QuickSearch to find the 3rd largest number in an array of size n=7. If the selected pivot in the first partition is the largest element in the array, what will be its final position in the array after the partition step?

- a. First position
- b. Third position
- c. Seventh position
- d. Sixth position

29. In a Job Scheduling scenario, there are 'n' tasks with their respective deadlines and profits. The scheduler uses a greedy algorithm to maximize profit. Suppose there are 4 tasks with their respective deadlines of 4, 1, 1, and 1 units, and respective profits of 20, 10, 40, and 30 units. What is the maximum profit that can be earned from this job scheduling?

- a. 50 units
- b. 60 units
- c. 70 units
- d. 80 units

30. Peter has been working on an ML project and is performing correlation Tests on a DataSet. He needs to estimate how likely the observations made would be (by considering the assumption of the null hypothesis) true.

Which of the following does he need to use to achieve this?

- a. Pearson's Correlation Coefficient
- b. Spearman's Rank Correlation Coefficient
- c. Chi-Squared Test
- d. Kendall's Rank Correlation Coefficient

31. When an object is passed to a function, its copy is made in the function and then_____

- a. The destructor is never called in this case
- b. The destructor is called but it is always implicit
- c. The destructor must be user defined
- d. The destructor of the copy is called when function is returned

32. A Red-Black tree has been made, with a root number of 10, and children ages 7 and 14.

Red is the hue of the child nodes. The seven children would be

- a. Red
- b. Black
- c. Uncoloured
- d. Red-Black mix

33. Consider an element that was the first to arrive in a queue. Which of the following statements about that element is correct?

- a. It will enqueue first
- b. It will enqueue last
- c. It will never enqueue
- d. It will enqueue in middle

34. Usually a pure virtual function

- a. Will never be called
- b. Has complete function body
- c. Will be called only to delete an object
- d. Is defined only in derived class

35. You are given a large dataset consisting of millions of records. Each record contains an integer value. Your task is to find the kth largest element from the dataset efficiently.

Which algorithm would you choose to solve this problem?

- a. QuickSort
- b. HeapSort
- c. Radix Sort
- d. Binary Search Tree

36. Consider the JPA based code segment below:

1. @OneToOne
2. @MapsId
3. @JoinColumn(name = "roll")
4. private Session session;

What kind of annotation is present at line number 2?

- a. Primary
- b. Composition
- c. Association
- d. Internalization

37. Which feature of OOPS described the reusability of code?

- a. Inheritance
- b. Polymorphism
- c. Encapsulation
- d. Abstraction

38. An Algorithm is required to be used on a website where the plagiarism is to be checked.

Which of the following can be used?

- a. Separate
- b. KMP
- c. Open Hashing
- d. Floyd Warshal

39. Assume the following weights and values: Weights: [10, 25, 15, 40] Values: [60, 100, 90, 120] The maximum weight capacity of the knapsack is 60 units. What is the maximum total value that can be placed in the knapsack?

- a. 250
- b. 270
- c. 280
- d. 290

40. In a given graph with 10 vertices and 8 edges, you start a Breadth-First Search (BFS) from a specific vertex. Unfortunately, the BFS halts prematurely due to a system error after visiting 5 vertices. How many vertices were not visited by the BFS before it stopped?

- a. 3
- b. 4
- c. 5
- d. 6

41. Consider a stack of size 3 is stack(25,26,27)

```
POP(stack, item)
POP(stack, item)
PUSH(4)
PUSH(3)
PUSH(2)
POP(stack, item)
```

What will be the top most element of the stack?

- a. 4
- b. 25
- c. 2
- d. 3

42. Consider a binary tree where each node contains a single digit from 0 to 9. You traverse the tree using an In-order traversal and the output sequence is 4, 2, 5, 1, 8, 3, 6. You also use a Pre-order traversal and the output sequence is 1, 2, 4, 5, 3, 8, 6. What would be the Post-order traversal sequence for the same binary tree?

- a. 4,5,2,8,6,3,1
- b. 4,2,5,6,8,3,1
- c. 4,5,2,8,3,6,1
- d. 5,4,2,6,8,3,1

43. You are given a binary tree with integer values. Each node in the tree represents a mathematical expression in prefix notation. Your task is to evaluate the expression and return the result.

Given the following binary tree:

```
+  
/\  
* 6  
/\  
5 4
```

What is the result of evaluating the expression represented by this binary tree?

- a. 38
 - b. 24
 - c. 26
 - d. 20
44. George is working on an ML project and is required to convert the given element into "mantissa" and "twos exponent".

Which of the following functions should he use?

- a. trunc
 - b. fmod
 - c. frexp
 - d. idexp
45. There is now a dequeue for input constraints. Which statement about such a dequeue is accurate?
- a. Input is restricted at both ends
 - b. input is restricted at any end
 - c. Input is restricted at the back
 - d. Input is restricted at the front

46. Take the string a = "datastructuresandalgorithms". Determine the index location of the second instance of the character "s" in the string a. (Think about a 0 based indexing system.)

- a. 4
 - b. 5
 - c. 13
 - d. 10
47. Consider a sequence of numbers 72, 40, 36, 15, 71, 31, 17, 62 to be sorted using Shell Sort. The gap sequence is defined by Knuth's formula, $h = 3h + 1$, starting with $h=1$. If we follow this gap sequence and apply Shell Sort, how many swaps will be made after the second gap ($h = 4$)?
- a. 5 swaps
 - b. 4 swaps
 - c. 3 swaps
 - d. 6 swaps

48. How many parent nodes may a node in a binary tree have?

- a. 2
- b. 4
- c. 3
- d. 1

49. Which of the following ways are legal to access a class data member using this pointer?

- a. this->x
- b. this.x
- c. *this.x
- d. *this-x

50. Class A has two protected member variables a=5 and b=15. Class B inherited class A in public mode. In Class B there is a member function mem() which sets the value of an equals 0 mem() function. If we create an object of class B and call mem() with it then what will be the value of a after this call?

- a. 5
- b. 0
- c. 15
- d. 10

51. How can a static member function be called in the main function?

- a. Using dot operator
- b. Using dot or arrow operator
- c. Using dot, arrow or using scope resolution operator with class name
- d. Using arrow operator

52. George has a[] = 24,39,40,51,22,80,73 array. After creating a min-heap and a max-heap from it and inserting 23 and 90 into both heaps, which node is the root node of the min-heap and which node is the root node of the max-heap? A min-heap is a complete binary tree in which the value of each internal node is less than or equal to the value of that node's offspring. A max-heap is a complete binary tree in which each internal node's value is larger than or equal to the values of that node's offspring

- a. Root of the min-heap: node 24, root of the max-heap: 90
- b. Root of the min-heap: node 22, root of the max-heap: 80
- c. Root of the min-heap: node 23, root of the max-heap: 80
- d. Root of the min-heap: node 22, root of the max-heap: 90

53. Which of the following statements best describes the purpose and effect of rehashing in a hashmap?

- a. Rehashing aims to balance entries across buckets, reducing collisions and improving performance.
- b. Rehashing is done to lower the memory use of the hashmap, but it may negatively affect performance.
- c. Rehashing reduces the time needed for the hash function, improving insertion speed.
- d. Rehashing optimizes hashmap size, but can increase the load factor and decrease performance.

54. If in an RSA algorithm, we have a public key $(e, n) = (7, 33)$ and we want to encrypt a plaintext message, $M=2$, what would be the encrypted ciphertext C?

- a. 29
- b. 8
- c. 16
- d. 21

55. Which one of the following options is correct?

- a. Friend function can access public data members of the class.
- b. Friend function can access protected data members of the class.
- c. Friend function can access private data members of the class.
- d. All of the above

56. Which of the following approaches is adapted by C++?

- a. Top-down
- b. Bottom-up
- c. Right-left
- d. Left-right

57. Which of the given below statements is INCORRECT about Linked Lists

- a. A node can be added and deleted from any location of the linked list
- b. Linked lists have dynamic size allocation
- c. The size of a linked list can be changed once initialized
- d. None of the above

58. Lise has written a Java code in which the parent and child classes have the same methods.

Which of the following keyword will help him in removing that ambiguity?

- a. Extends
- b. Final
- c. Abstract
- d. Super

59. When simulating a stack with a linked list, where should we place a new element?

- a. At the head
- b. At the tail
- c. At any Random position
- d. At the middle

60. You need to implement a linked list data structure. Which of the following scenarios would be the most appropriate and efficient use case for utilizing a linked list?

- a. Storing and manipulating a large dataset of customer transaction records in real-time.
- b. Implementing a priority queue to process a stream of incoming data points in a time-series analysis.
- c. Performing complex graph-based algorithms such as breadth-first search or Dijkstra's algorithm on a social network dataset.
- d. Storing and retrieving user preferences and settings in an application.

61. Given below are some of the algorithms, find the odd one out amongst the following?

- a. Boyer-Moore
- b. Separate Chaining
- c. Linear Probing
- d. Double hashing

62. Consider a given linked list (11 -> 5 -> 9 -> 10 -> 11 -> 8 -> 2 -> 6 -> 7 -> 10) and you have to traverse from the beginning. An element is considered good if that element is strictly smaller than the next element in the linked list. Find out the total number of good elements in the given above linked list.

- a. 4
- b. 6
- c. 7
- d. 5

63. Which of the following algorithms has the worst time complexity of O(n)?

- a. Recursive LS
- b. Iterative LS
- c. Both A and B
- d. Neither A nor B

64. Tree and Graph is an example of?

- a. Linear data structure
- b. Non-linear data structure
- c. Arrow based data structure
- d. Both A and B

65. Which of the following is true about array element with index 1?

- a. It represents the first element of the array
- b. It is equal to 1
- c. It represents the second element of the array
- d. None of the mentioned

66. Suppose a prefix expression is as follows

$+ + 6 9 + * 4 2 ^ 4 2$

What would be the evaluated expression?

- a. 36
- b. 39
- c. 41
- d. 42

67. Which of the following algorithms cannot be used if 2 strings "ABCD" and "CD" are to be matched?

- a. Boyer-Moore
- b. Rabin & Karp
- c. KMP
- d. Linear Chaining

68. There are 2 lists as follows:

2 4 7 9 10

1 3 4 6 8

To merge these lists, time complexity would be:

- a. O(mn)
- b. O(mlogn)
- c. O(nlogm)
- d. O(m+n)

69. You have to convert the given array arr into a non-decreasing array. You can only remove numbers from the ends of the array. Which of the sets of operations will result in arr being sorted? $\text{arr}[7] = \{4,3,3,8,4,5,2\}$

- a. Remove 4,3,3,8 from the beginning of the array.
- b. Remove 8,4,5,2 from the end of the array.
- c. Remove 4 from the beginning of the array and 2, 5, 4 from the end of the array
- d. None of these

70. A Tree traversal is given as follows : 3 2 4 6 12 4 9 11

12 is the root of this tree.

The traversal here is :

- a. Postorder
- b. Preorder
- c. Inorder
- d. Level-order

71. Which of the following represented as an array is a full binary tree? (Note: "_" represents blank element).

- a. {1,2,3,_,_,6,7,_,5}
- b. {1,2,3,4,_,6,7,_,_}
- c. {1,2,3,_,_,6,7}
- d. {1,2,3,_,_,6,7,5,_}

72. Which algorithm cannot find out the shortest path if there is a cycle with a negative length in the graph?

- a. Dijkstra's Algorithm
- b. Bellman-Ford Algorithm
- c. Floyd-Warshall Algorithm
- d. All of the above

73. How many times the inner loop is executed for a modified selection sort, and what would the array look like after the 2nd iteration of the outer loop?

The array = [7 3 28 10 38 22 1 2 34 2]

- a. 1 time, [1 2 2 3 7 10 22 28 34 38]
- b. 10 times, [1 2 28 10 38 22 7 3 34 2]
- c. 5 times, [1 2 2 3 7 10 22 28 34 38]
- d. 5 times, [1 2 28 10 3 22 7 2 34 38]

74. What will be the value of the address field of the last element of any circular singly linked list?

- a. null
- b. address of second last field
- c. address of first element
- d. None of the mentioned

75. Consider a 3-D array X[100] [20] [50]. Sara wants to get the value stored at index X[15] [5] [45] using pointer. What will be the equivalent pointer expression of referring to the element at X[15] [5] [45]?

- a. *** ((X + 15) + 5) + 45
- b. * (* (* (X + 15) + 5) + 45)
- c. *** ((X + 45) + 5) + 15
- d. *** ((X + 45) + 5) + 15

76. Consider an element that queued in first in a queue. Which of the following statements about that element is correct?

- a. It will enqueue first
- b. It will enqueue last
- c. It will never enqueue
- d. It will enqueue in middle

77. Which of the data structure has a back edge?

- a. Singly Linked List
- b. Tree
- c. Graph
- d. All of these

78. Consider an element that "push" in first in a stack. Which of the following is true about this element?

- a. It will pop out first
- b. It will pop out last
- c. It will never pop out
- d. It will pop out in the middle

79. Which of the following is true about the Hash tables?

- a. It can have duplicate values and keys
- b. It cannot have duplicate values
- c. It can have duplicate values but no duplicate keys
- d. It can have duplicate keys but no duplicate values

80. In a tree where 21 & 13 are children of 1, and 14 & 51 are children of 21, what will be the BFS traversal of that tree starting from 1?

- a. 1->21->14->51->13
- b. ->13->14->21->51
- c. 1->21->13->14->51
- d. 1->14->51->21->13

81. An Array is to be divided based on some conditions where it is divided based on the sum is most likely solved using:

- a. Greedy
- b. Recursion
- c. DP
- d. Divide and Conquer

82. Consider a stack of size 3 is stack(25,26,27)

POP(stack, item)

POP(stack, item)

PUSH(4)

POP(stack, item)

PUSH(3)

PUSH(2)

What will be the bottom most element of the stack?

- a. 4
- b. 25
- c. 3
- d. 26

83. Consider a stack of size 4 is stack (1,2,3,_)

POP(stack, item)

PUSH(4)

POP(stack, item)

PUSH(3)

POP(stack, item)

What will be the topmost element of the stack?

- a. 1
- b. 2
- c. 3
- d. 4

84. which of the following options represents the mutable sequence of characters?

- a. StringTokenizer
- b. StringBuilder
- c. StringBuffer
- d. Both b and c

85. Suppose you are given an array of 10 elements X [10] = {5, 7, 16, 10, 9, 50, 74, 23, 77, 54}.

Which of the following statements is CORRECT for linear searching any element from the array

- a. The array needs to be sorted in ascending order before the linear search
- b. The array needs to be sorted in descending order before the linear search
- c. The array needs to be sorted in any order (ascending/descending) before the linear search
- d. The array need not be sorted in any order (ascending/descending) before the linear search

86. Sara is given a tree data structure to study and observe Which of the following is a correct observation about tree data structures?

- a. A node cannot have more than two child
- b. A node can have only 2 child (left child and right child)
- c. A node can have more than 2 child
- d. A node can have either 2 or no child

87. Suppose you are given an array(0 - indexed) a [11]={22,31,48,72,90,37,52,60,11,9,27}. You constructed a binary search tree by passing the array elements one by one (firstly a[0], then a[1], then a[2]... up to a[10]). What will be the parent node and left child of node 72?

- a. Parent node: 90, left child: 52
- b. Parent node: 90, left child: 48
- c. Parent node: 48, left child: 52
- d. Parent node: 37, left child: 48

88. Johnny has an array arr[]= {18, 32, 25, 41, 63, 11, 45}. He wants to find 18 using binary search. What will be the first element that he will get when he starts searching and what will be the last element before he gets the desired element?

- a. First element: 41, Last element: 32
- b. First element: 32, Last element: 32
- c. First element: 41, Last element: 18
- d. First element: 25, Last element: 32

89. An internal sorting algorithm is being used for an array. Which among the following can be used?

- a. Buckets
- b. Cache Memory
- c. Main Memory
- d. Disk Space

90. You have an array with 777 numbers. You use linear search to determine whether the number 200 is in this array or not. How many elements of the array will you look at if the number 200 is not present in the array

- a. 10
- b. 1
- c. 200
- d. 777

91. void fun(node * head)

```
{  
    cout<<head->next->data;
```

} Head node of a linked list is passed to this function and after running the function gives an output of 2, so how the whole linked list will look?

- a. 2 -> 1 -> 3 -> 4
- b. 1 -> 2 -> 3 -> 4
- c. 4 -> 3 -> 2 -> 1
- d. 4 -> 3 -> 1 -> 2

92. Consider the array $\text{marks}[10] = \{99, 75, 85, 43, 22, 63, 69, 74, 92, 81\}$ containing the scores of 10 students. Which of the following statements is INCORRECT?

- a. 75 is the 5th highest score in the class
- b. 63 is the 3rd lowest score in the class
- c. 69 is the 7th highest score in the class
- d. 85 is the 2nd highest score in the class

93. Evaluate the following Prefix Expression: $2\ 5\ 3\ -\ *\ 14\ +\ 2\ /$

- a. -15
- b. -9
- c. 9
- d. 15

94. Which of the following Sorting Algorithms has the same time complexity for all cases (Best-Case, Worst-Case, Average-Case)?

- a. Bubble Sort
- b. Insertion sort
- c. Merge sort
- d. Quick Sort

95. Consider a string and the cost of the string is calculated by the number of vowels and consonants present in the string. Each vowel costs 4 USD and each consonant costs 3 USD. What is the cost of the string `BinarySearch`?

- a. 41 USD
- b. 42 USD
- c. 43 USD
- d. 44 USD

96. Consider a string `a = "datastructuresandalgorithms"` Which of the following options is INCORRECT about the string `a`?

- a. SubString "a" occurs 4 times in the string `a`
- b. SubString "u" occurs 2 times in the string `a`
- c. SubString "t" occurs 3 times in the string `a`
- d. SubString "c" occurs 1 time in the string `a`

97. Determine the time complexity for insertion Sort of the given array $\text{arr}[10] = \{"\text{Elements will be given}"\}$

- a. $O(\log n)$
- b. $O(n)$
- c. $O(1)$
- d. $O(n \log n)$

98. What is the 1's complement of 3?

- a. -4
- b. 2
- c. 8
- d. 4

99. Predict the output of the given code -

```
int main() {  
    a=5;  
    while(a==5) {  
        print('SOCIAL');  
        break;  
    }  
    return 0;  
}
```

- a. SOCIAL is printed unlimited number of times
- b. SOCIAL
- c. Compilation error
- d. SOCIA

100. What is value of a after execution?

```
#include<stdio.h>  
int main() {  
    int a = 2++;  
    printf("%d",a);  
    return 0;  
}
```

- a. 3
- b. Error
- c. 8
- d. 45

101. In a given loop-

```
i=1;  
while(i<=10)  
{  
    statement 1;  
    statement 2;  
    i++;  
}
```

What does i++ operator do?

- a. Increments the value by 1
- b. Increment the value by 2
- c. Increment the value till infinite
- d. Decrement the value

102. The output of the following code

```
void solve() {  
    int arr[] = {10, 20, 30, 40, X, 90};  
    int *ptr1 = arr;  
    ptr1++;  
    int *ptr2 = arr + 4;  
    cout << (*&*ptr2 - *ptr1);  
}
```

is 30. The value of X is

- a. 30
- b. 40
- c. 50
- d. 60

103.

```
int main()  
{  
    int arr[10] = {21,13,17,32,8,15,19,12,4,25}, ans = 0;  
    for(int i = 0; i < 10; i++)  
        if(arr[i] & (arr[i] - 1))  
            ans += 1;  
    return 0;  
}
```

What is the value of ans after execution of the above program?

- a. 7
- b. 8
- c. 9
- d. 10

104.

```
#include<bits/stdc++.h>  
using namespace std;  
int main()  
{  
    int m,n;  

```

If the output of the program is 4, then what will be the values of m and n?

- a. m = 4, n = 2
- b. m = 5, n = 6
- c. m = 4, n = 9
- d. m = 4, n = 8

105.

```
int fun(int n)
{
    if(n <= 2)
        return n;
    return fun(n - 1) + fun(n - 2) + fun(n - 3);
}
int main()
{
    int x = fun(13);
    return 0;
}
```

What is the primality of x?

- a. Prime
- b. Composite
- c. Neither Prime nor composite
- d. None of these

106. Consider the following code

```
for(int i=0; i<n; i++)
    if(arr[i]%2)continue;
    int temp1= i-1,temp2=i+1;
    while(temp1>=0&&arr[temp1]%2)temp1--;
    while(temp2<n&&arr[temp2]%2)temp2++;
}
```

What is the time complexity of the following code and the maximum number of times an index is traversed by the code i.e by the for and the while loop?

- a. O(n), 3 times
- b. O(n), 3 times
- c. O(n), n times
- d. O(2), 1 time

107. How many times the function will be called(excluding the initial) if the value of n is

- a)7
- b)0
- c)-1

- a. 6,1,1
- b. 7,0,0
- c. 7,0,Indefinite(until its memory is overflowed)
- d. 7,0,Infinite number of times

```
int func(int n){
    if(n==0)return 0;
    return (n-1)*func(n-1);
}
```

108.

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
    int n; //Line 1
    int k; //Line 2
    k=(n%2 == 0) ? 10:19; //Line 3
    cout<<k;
}
```

When the value of n is even, k should have the value of 19. How Line 3 should be modified such that the value of k will be 19?

- a. k = (n%2 == 0) : 19?10;
- b. k = (n%2 != 0) ? 19:10;
- c. k = (n%2 != 0) ? 10:19;
- d. k = (n%2 == 0) : 10?19;

109. Given a binary tree [5,6,7,12,8,11,null,null,null,9,null,null,14,13,null,null,null]

```
void f(Node* root, vector<int> & tra) {
    if (root == NULL) return;
    f(root->left, tra);
    tra.push_back(root -> value);
    f(root -> right, tra);
}
void func(Node* root, int val) {
    vector<int> tra;
    f(root, tra);
    for (int i = 0; i < tra.size(); i++) {
        if (tra[i] == val) {
            if (i+1 < tra.size()) cout << tra[i + 1];
            else cout << "null";
            break;
        }
    }
}
```

What can be the value of the val argument if func(root, val) gives a output of 7?

- a. val=14
- b. val=11
- c. val=13
- d. val=6

110.

```
void solve()
{
    string str = "[]][][X]";
    stack<char>st;
    bool flag = true;
    for (auto it:str) {
        if (it == '[')st.push(it);
        else {
            if (st.size() == 0) (flag = false; break; )
            else st.pop();
        }
    }
    if (st.size())flag = false;
    cout << (flag? "Fine": "Not Fine");
}
```

What would be the character at position X if the output of the following code is Not Fine?

- a.]
 - b. [
 - c. No character required
 - d. Both A and B
111. What is the name of the algorithm used in the following code

```
Struct {
    int data;
    struct Node* next:
};
int fun(Node* root)
{
    Node *x = root, *y = root;
    while (x && y&& y -> next) {
        x = x ->next;
        y = y -> next -> next;
        if (x == x) {
            return 1;
        }
    }
    return 0;
}
```

- a. Two Pointer
- b. Floyd's Cycle-Finding Algorithm
- c. Slow-Fast Algorithm
- d. Loop Algorithm

112. What is the output of the following code

```
#include <iostream>
using namespace std;
long, long int n = 10;
void solve(long, long int &m)
{
    m = 15;
    n = 20;
    m = 24;
}
int main() {
    solve(n);
    cout<<n<<endl;
    return 0;
}
```

- a. 15
- b. 20
- c. 24
- d. 10

113. What is the time complexity of the following code?

```
for(int a=1; a<=n; a++) {
    for(int b=a; b<=n; b+=a)(//Operation//)
}
```

- a. O(n_)
- b. O(nlogn)
- c. O(n)
- d. O(2_)

114. What would the below code print?

```
#include <iostream>
#include <bits/stdc++.h>
using namespace std;
int main()
{
    int b = 3;
    float c=10/b;
    cout<<(ceil(c));
    return 0;
}
```

- a.
- b. 1
- c. 2
- d. 3

115. What is the output of the below code?

```
int main()
{
    int A[10]={1,2,3,4,5,6,7,8,9,10};
    int ans=0;
    for(int i=0;i<10;i++)
    {
        if ((A[i] & (A[i]-1)) == 0)
            ans += 1;
        else if((A[i]) & (A[i] + 1)) == 0)
            ans -= 1;
        else
            ans <<= 1;
    }
    cout << ans;
    return 0;
}
```

- a. 4
- b. 8
- c. 16
- d. 32

116. Consider the following code and identify the output that it will print.

```
import java.util.*;
public class Main {
    public static void main(String[] args) {
        int[] array1 = {1, 2, 3},
        int[] array2 = array1.clone();
        array2[0] = 10;
        int sum = 0;
        for (int i = 0; i < array1.length; i++) {
            sum += array1[i];
        }
        System.out.println(sum);
    }
}
```

- a. 2
- b. 4
- c. 5
- d. 6

117. What will be the output of the following Java program?

```
class X
{
int a;
double b;
}

class Y extends X
{
int c;
}

class Output
{
public static void main(String args[])
{
X a = new X();
Y b = new Y();
Class obj;
obj = b.getClass();
System.out.print(obj.isLocalClass());
}
}
```

- a. 0
- b. 1
- c. TRUE
- d. FALSE

118. Find the time complexity of the following iterative code:

```
int i=0, j=N; // N is any positive
integer
while(j>0)
{
i=i*j;
j=j/2;
}
```

- a. O(1)
- b. O(N)
- c. O(log n)
- d. O(sqrt(n))

119. What will be the output of the following Java program?

```
class recursion
{
    int fact(int n)
    {
        int result;
        if (n == 1)
            return 1;
        result = fact(n - 1) * n;
        return result;
    }
}
class Output
{
    public static void main(String args[])
    {
        recursion obj = new recursion();
        System.out.print(obj.fact(6));
    }
}
```

- a. 1
- b. 30
- c. 120
- d. 720

120. Consider you are trying to set the size of a stack for which this code has been written.

Identify the output that it will print.

```
import java.util.Stack;
public class StackExample {
    public static void main(String[] args) {
        Stack<String> stack = new Stack<>();
        stack.push("A");
        stack.push("B");
        stack.push("C");
        stack.setSize(2);
        System.out.println(stack.size());
    }
}
```

- a. Run-time error
- b. Compile time error
- c. 2
- d. 3

121. What will be the output of the following Java program?

```
import java.io.*;
public class filesinputoutput
{
public static void main(String[] args)
{
String obj = "abc";
byte b[] = obj.getBytes();
ByteArrayInputStream obj1 = new ByteArrayInputStream(b);
for (int i=0; i<2; ++i)
{
int c;
while ((c = obj1.read()) != -1)
{
if (i == 0)
{
System.out.print(Character.toUpperCase((char)c));
obj2.write(1);
}
}
System.out.print(obj2);
}
}
}
```

- a. AaBaCa
- b. ABCaaa
- c. AaaBaaCaa
- d. AaBaaCaaa

122. Which of the following methods will start this thread?

```
public class MyThread implements Runnable
{
public void run()
{
// some code here
}
}
```

- a. new Runnable(MyThread).run();
- b. new Thread(MyThread).start();
- c. new Thread(new MyThread()).start();
- d. new MyThread().run()

123. The following code is performing some operations on stack.

Analyse and identify its output.

```
import java.util.Stack;
public class StackExample {
    public static void main(String[] args) {
        Stack<String> stack = new Stack<>();
        stack.push("Java");
        stack.push("is");
        stack.push("fun");
        String top=stack.peek();
        stack.pop();
        stack.push(top.toUpperCase());
        System.out.println(stack.pop());
    }
}
```

- a. FUN
- b. fun
- c. Fun
- d. compiler error

124. You are working on a scheduling application for managing appointments in a hospital in Los Angeles. You need to find all the available time slots between a given start time and end time, considering existing appointments.

```
bool isAvailable(vector<Appointment> appointments, Time startTime, Time endTime) {
    for (const auto & appointment : appointments)
    {
        if (appointment.startTime <= endTime && appointment.endTime
            >= startTime)
        {
            return false;
        }
    }
    return true;
}
```

Which of the following approaches can efficiently solve this problem?

- a. Using the provided code snippet to check each appointment's availability and gather the available time slots.
- b. Implementing a breadth-first search algorithm to find the available time slots.
- c. Using a priority queue to store appointments and then checking for available time slots.
- d. Applying the binary search algorithm to search for available times slots efficiently.

125. What will be the output of the following code snippet?

```
#include <iostream>
int main() {
    int arr[] = {3, 7, 2, 9, 5};
    int *ptr = arr;
    ptr += 3;
    std::cout << *ptr << std::endl;
    return 0;
}
```

- a. 3
- b. 7
- c. 2
- d. 9

126. If N is passed to this function and the value of N is 7, then what will be printed by this function?

```
VOID FUN (INT N)
{
    IF (N<=0) RETURN
    PRINT N
    FUN(N/2)
}
```

- a. 7 3 1`
- b. 1 3 7`
- c. 0 7 3 1`
- d. 1 3 7 0`

127. Consider the following code written in cpp and choose the option representing its correct output.

```
#include <vector>
#include <iostream>
int main(){
    std::vector<int> nums = {1, 2, 3, 4, 5};
    std::vector<int>::const_iterator it = nums.begin() + 3;
    std::cout << *it << std::endl;
    return 0;
}
```

- a. 3
- b. 4
- c. 5
- d. Compilation error

128.

```
#include<bits/stdc++.h>
using namespace std;
int main() {
    int a,b;
    int c=a+b;
    a=c-b;
    b=c-a;
    cout<<a<<" "<<b;
}
```

If 4 5 is the output of the program, then what will be the values of a and b?

- a. a=5, b=4
- b. a=4, b=5
- c. a=4, b=4
- d. a=5, b=5

129.

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
    int arr[]={1,2,3,4}; //Line 1
    for(int i=1; i<=5; i+=2) //Line 2
    {
        cout<<arr[i]<<" "; //Line 3
    }
}
```

To get the output as 2 4, which one of the line should be changed?

- a. Line 1
- b. Line 2
- c. Line 3
- d. No change is required

130. Find the output of the given code:

```
int main() {
    int arr[8]={1,2,3,4,5,6};
    cout<<arr[2]<<" "<<arr[6]<<" "<<arr[8];
    return 0;
}
```

- a. 2, 6, 0
- b. 2, 6, garbage value
- c. 3, 6, 1
- d. 3, 0, garbage value

131.

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
    int a = 5; //Line 1
    int* const p = &a; //Line 2
    cout<<*p+1; //Line 3
}
```

If the user wants to get an output of 6, then which line he should modify?

- a. Line 1
- b. Line 2
- c. Line 3
- d. No change is required

132. Which of the following technique is used in the following code:

```
Long Long fun(Long Long x, Long Long y) {
    if(y == 0)
        return 1;
    Long Long res = fun(x, y/2);
    if(y%2)
        return res * res * x;
    else
        return res * res;
}
```

- a. Matrix Exponentiation
- b. Two Pointer Approach
- c. Binary Exponentiation
- d. Z-function

133.

```
int main() {
    vector<int> arr = {21,13,17,32,8,15,19,12,4,25};
    for (int i = 0; i < 10; i++)
        if (arr[i] % 2 == 1)
            reverse(arr.begin(), arr.begin() + i);
    for (int i : arr)
        cout << i << " ";
    return 0; }
```

What will be the output of the above code?

- a. 4 12 8 32 17 13 21 15 19 25
- b. 4 12 8 32 21 19 17 15 13 25
- c. 4 12 19 8 32 17 21 13 15 25
- d. 4 8 12 32 21 13 17 15 19 25

134. Given the following code, what is the value of A and B?

```
int main() {
    int x = A, y = B;
    priority_queue<int>pq; pq.push(x);
    pq.push(y);
    int iter = 4;
    while (iter--) {
        int a = pq.top();
        pq.pop();
        int b = pq.top();
        pq.pop();
        int c = a + b;
        pq.push(a);
        pq.push(b);
        pq.push(c);
    }
    cout << pq.top() << " ";
    pq.pop();
    cout << pq.top() << " ";
}
```

If the output of the following code is 69 43

135.

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
    string s,s1;
    int n=s.size();
    s1+=s[0]; s1+=s[n-1];
    cout<<s1;
}
```

If the output of the program is "fd" then what will be the initial value of string s?

- a. s="abcdef"
- b. s="fdabcs"
- c. s="fbcd"
- d. s="dfcb"

136. What will be the value of S at the end of the program?

```
void fun(string &S)
{
    for(int i=n-2; i>=0; i--)// n = Length of string
    {
        if(S[i] < S[i + 1])
        {
            breakpoint1 = i;
            break;
        }
    }
    if(breakpoint1 != -1)
    {
        for(int i=n-1; i>=0; i--)
        {
            if(S[i] > S[breakpoint1])
            {
                breakpoint2 = i;
                break;
            }
        }
        swaps(S[breakpoint1], S[breakpoint2]);
    }
    reverse(S.begin() + breakpoint1 + 1, S.end());
}
int main()
{
    string S = "ghijli";
    for(int i=1; i<=5; i++)
        fun(S);
}
```

- a. ghjiil
- b. ghjl ii
- c. ghljii
- d. ghliij

137.

```
#include<bits/stdc++.h>
using namespace std;
int main() {
    int m,n,
    cout<<(m^0)<<" "<<(n^1);
}
```

The program gives an output of 3 4, then what will be the values of m and n?

- a. m = 4, n = 4
- b. m = 5, n = 5
- c. m = 3, n = 4
- d. m = 3, n = 5

138. Given the following code:

```
int lb = 0, ub = n - 1;
int k = 17;
int iter = 0;
while (lb <= ub) {
    iter++;
    if (a[lb] + a[ub] == k) {
        lb++; ub--;
    }
    else if (a[lb] + a[ub] < k)
        lb++;
    else
        ub--;
}
```

What would be the value of iter, a[lb] and a[ub] when the first time the if condition is satisfied for the sorted array [1 4 6 7 10 11 21] with n = 7

139.

```
#include<bits/stdc++.h>
using namespace std;
int main() {
    int n=5; //Line 1
    int x; //Line 2
    stack<int>st; //Line 3
    for(int i=0;i<n;i++) //Line 4 {
        cin>>x; //Line 5
        st.insert(x); //Line 6
    }
    cout<<st.size(); //Line 7 }
```

How Line 6 should be modified so that the output is 5?

- a. st.insert_front();
- b. st.push_front();
- c. st.push();
- d. The Line should not be modified.

140. Which of the following traversal approaches is used in the given function?

```
void fun(int s, vector<int>&adj,
bool visited[]) {
visited[s] = true;
for(int i = 0; i < adj[s].size(); ++i) {
if(visited[adj[s][i]] == false)
fun(adj[s][i]);
}
}
```

- a. Level Order Traversal
- b. Breadth First Search
- c. Depth First Search
- d. Inorder Traversal

141. Consider the Algorithm below:

```
for i = 1 to |V|-1
for each edge(u, v) in E
relax(u, v, w(u, v))
for each edge(u, v) in E
if can still relax that edge, --cycle found
```

This is the algorithm for which of the Graph algorithms?

- a. Dijkstra's Algorithm
- b. Bellman Ford
- c. DFS
- d. BFS

142.

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
string s;
int sz = s.size();
cout << s[sz / 2];
}
```

If the program gives an output of 'a', then what will be the value of s?

- a. "aabc"
- b. "aabac"
- c. "caac"
- d. "cacac"

143.

```
#include <bits/stdc++.h>
using namespace std;
bool fun(string s, int j, int i) {
    return s[j] == s[i];
}
int main() {
    string s;
    cin >> s;
    int n = s.size();
    int k = n - 1;
    int count = 0;
    for (int i=0; i<n; i++) {
        if (fun(s,i,i+k)) count++;
        k--;
    }
    cout << count;
}
```

If the program gives an output of 4, then which of the given strings is the correct input?

- a. "abcdabdc"
- b. "adfcgghaddd"
- c. "aaaaaaaa"
- d. "abcdaddad"

144. Which of the sorting technique is used in the following code:

```
void fun(vector& a){
    int maxx = *max_element(a.begin(), a.end());
    int min = *min_element(a.begin(), a.end());
    int r = maxx - min + 1;
    vector<int> hash(r), brr(a.size());
    for (int i = 0; i < a.size(); i++)
        hash[a[i] - min]++;
    for (int i = 1; i < hash.size(); i++)
        hash[i] += hash[i - 1];
    for (int i = a.size() - 1; i >= 0; i--) {
        brr[hash[a[i] - min] - 1] = a[i];
        hash[a[i] - min]--;
    }
    for (int i = 0; i < a.size(); i++)
        a[i] = brr[i];
}
```

- a. Selection Sort
- b. Count Sort
- c. DNF Sort
- d. Heap Sort

145.

```
#include <bits/stdc++.h>
using namespace std;
int main() {
priority_queue<int> pq;
int n, k;
cin >> n >> k;
int arr[n];
for (int i = 0; i < n; i++)
cin >> arr[i];
for (int i = 0; i < n; i++) {
pq.push(arr[i]);
if (pq.size() == k) pq.pop();
}
cout << pq.top();
}
```

If $k = 2$ and the output of the program is 5, then which of the given arrays is the correct input?

- a. arr[] = {1,2,3,4,5}
- b. arr[] = {6,5,3,2,1}
- c. arr[] = {4,6,7,8,5,9}
- d. arr[] = {9,10,5,23,12}

146. Given the function to find the nth catalan number using dynamic programming. Some lines are missing in the code. Complete the code by choosing the correct option.

```
int fun(int n) {
int []dp = new int [n+1];
dp[0]=dp[1]=1;
// complete the code so to find the nth catalan number
print(dp[n]); }
```

Input-4

Output-14

- a.

```
for(int i=2;i<n;i++){
int ans=0;
for(int j=0;j<i;j++){
ans+=dp[j]*dp[i-j-1];
}
dp[i]=ans;
}
```
- b.

```
for(int i=2;i<=n;i++){
int ans=0;
for(int j=0;j<i-1;j++){
ans+=dp[j]*dp[i-j-1];
}
dp[i]=ans;
}
```

- c.

```
for(int i=2;i<=n;i++){
    int ans=0;
    for(int j=0;j<i;j++){
        ans+=dp[j]+dp[i-j-1];
    }
    dp[i]=ans;
}
```
- d.

```
for(int i=2;i<=n;i++){
    int ans=0;
    for(int j=0;j<i;j++){
        ans+=dp[j]*dp[i-j-1];
    }
    dp[i]=ans;
}
```

147.

```
#include<bits/stdc++.h>
using namespace std;
int main() {
    int x;
    switch(x) {
        case 1:
            cout << "This is not default" << endl;
        case 2:
            cout << "This is not default" << endl;
            break;
        default:
            cout << "This is default" << endl;
    }
}
```

For which value of x will the program give an output of 'This is not default' twice?

- a. if $x = 1$
- b. if $x = 1$ or $x = 2$
- c. if $x = 0$
- d. None of these

148.

```
#include <bits/stdc++.h>
using namespace std;
int32_t main(){
ios_base::sync_with_stdio(false);
cin.tie(NULL);
int A[10];
for(int i=0; i<10;i++)
cin >> A[i];
for(int i = 0; i<9;i++)
{
for(int j=i+1; j<10; j++)
{
int k=i, l=j;
while(k<0)
{
swap(A[k], A[l]);
k +=1 ;
l -=1;
}
}
}
for(int i = 0; i<10;i++)
cout << A[i] << " ";
return 0;
}
```

The above code gives the output [7, 9, 14, 16, 11, 9, 15, 19, 8, 3].

What is the original array?

- a. [10, 15, 8, 16, 9, 11, 14, 3, 9, 7]
- b. [10, 15, 16, 8, 9, 7, 14, 3, 9, 11]
- c. [19, 15, 16, 8, 9, 11, 14, 3, 9, 7]
- d. [19, 15, 16, 8, 7, 11, 14, 3, 9, 9]

149.

```
vector<vector<int>> xy(n, vector<int>(m, 0));
for (int j = 0; j<n; j++) ( for (int j=0; j < m; j++)
{
if (i==0 || j==0) xy[i][j] = 1 ;
else xy[i][j] = xy[i - 1][j] + xy[i][j - 1];
}
}
```

Which of the vector look like after i = 1 and j = 2 is executed, if n = 5, m = 6?

150.

```
void func(Node *root)
{
    stack<Node *> st;
    st.push(root);
    while(!st.empty())
    {
        Node *curNode=st.top();
        st.pop();
        cout << curNode->data << ' ';
        if(curNode->right != NULL)
            st.push(curNode->right);
        if (curNode->left != NULL)
            st.push(curNode->left);
    }
}
```

The above function outputs: [1, 2, 6, 3, 4, 5]

What should be the array that the root pointer points to? (-1 refers to no child)

- a. [1, 2, 6, -1, -1, -1, 3, 4, -1, -1, 5, -1, -1]
- b. [1, 2, -1, 6, -1, -1, 4, 3, -1, -1, 5, -1, -1]
- c. [1, 2, -1, 6, -1, -1, 3, 4, -1, -1, 5, -1, -1]
- d.

151.

```
int main() {
    string a = "gcdhe";
    int j = 10000, ans = 0;
    for (char c : a) {
        ans += j * (c - 'a');
        j /= 10;
    }
    return 0;
}
```

What will be the value of ans after execution of the Program?

- a. 57263
- b. 62374
- c. 73485
- d. None of these