CS301- DTA STRUCTURE
(SOLVED MCQs)
FROM MIDTERM PAPERS
LECTURE (1-22)

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1. Consider the following infix expression. 7/8+9
   If one converts the above expression into postfix, what would be the resultant expression?
   a. 789/+
   b. 78/+9
   c. /78+9
   d. 78/9+
2. Suppose there are 100 elements in an equivalence classes so initially there will be 100 tree.The collection of tree is called_
   a. Cluster
   b. Class
   c. Forest
   d. Bunch
3. For a perfect binary tree of height h, having N nodes the sum of height of nodes is
   a. N-h-1
   b. N-1
   c. N-1+h
   d. -(h-1)
4. Sorting procedure normally takes _____time
   a. N log N
   b. 2 N
   c. N*N*N
   d. N
5. there are 100 elements in an equivalence classes then will have _____state initially
   a. 50
   b. 100
   c. 1000
   d. 80
6. _____ objects (objects accessed by pointers) are called anonymous objects.
   a. Private
   b. Nameless
   c. Friend

d. Public

7. _____ is a self-balancing tree.
   a. AVL
   b. Binary Tree
   c. Binary Search Tree
   d. ALV
8. Which of the following operation returns but do not removes top value of the stack?
   a. Push
   b. Pop
   c. Top
   d. First
9. Int htdiff = height(root->getLeft()) _____ height(root->getRight()); The above line of code is taken from AVL insert method.
   Complete it by selecting an appropriate symbol.
   a. -
   b. +
   c. /
   d. *
10. Which operation of the queue data structure is used to insert an element into the Queue?
   a. Enqueue()
   b. Dequeue()
   c. Fornt()
   d. Remove()
11. For making binary search tree for strings we need, _____ data type.
   a. Char
   b. Int
   c. Float
   d. Double
12. Local variables defined inside function body are _____ automatically at the end of function execution.
   a. Created
   b. Destroyed
   c. Incremented

d. Decremented

9. If a node has three fields, then this node will be related to
   a. Linked list
   b. Doubly linked list
   c. Circular linked list
   d. All of the given
10. _____ is an area in computer memory that is allocated dynamically.
   a. Heap
   b. Stack
   c. Queue
   d. Linked list
11. Linked list use _____ to store data.
   a. Array
   b. 2-D Array
   c. Variables
   d. Linked Memory
12. The lifetime of a transient object cannot exceed that of the application.
   a. True
   b. False
   c. In some cases
   d. None of the given
13. To represent hierarchical relationship between elements, which data structure is suitable?
   a. Dequeue
   b. Priority
   c. Stack
   d. Tree
14. Local variables of a function are stored in,
   a. Binary search tree
   b. Stack
   c. Queue
   d. AVL tree
15. In-order traversal method traverses tha data in
   a. Non sorted order
   b. Random order

c. Sorted order
d. None of the given

16. Dequeue() operation of queue data structure is used to _____
a. Get an element from the front of the queue
b. Remove an element from the front and return it
c. Insert an element at the front
d. Insert an element at the back

17. In a tree, we link the nodes in such a way that it _____ a linear structure.
a. Does not remain
b. Forms
c. Reverses
d. Remains

18. Factorial is an example of _____ function.
a. Recursive
b. Non-recursive
c. Cube
d. Log

19. All the objects created using _____ operator have to be explicitly destroyed using delete operator.
a. New
b. Delete
c. Del
d. Create

20. In the calling function, after the execution of the function called, the program continues its execution from the _____ after the function call.
a. Previous line
b. Next line
c. Beginning
d. None of the above

21. Last node in circular linked list contains
a. At least one null pointer
b. No null pointer
c. Maximum two null pointers
d. None of the given

22. One should be careful about transient _____ that are stored by reference in data structures.
    a. Objects
    b. Stack
    c. Function
    d. Tree
23. Binary search tree violates the condition of AVL tree when any node has balance equal to
    a. 2 or -2
    b. 1 or -1
    c. 0
    d. None of the options
24. Security of data is the main usage of AVL tree.
    a. True
    b. False
    c. In some cases
    d. None of the given
25. A binary tree whose every node has either zero or two children is called _____.
    a. Complete binary tree
    b. Binary search tree
    c. Strictly binary tree
    d. None of above
26. In internal memory organization of a process, there is some area of memory for static data that holds _____ variables.
    a. Static
    b. Global
    c. Not static neither global
    d. Both static and global
27. Following is true in case of using recursive method calls.
    a. The code becomes very long
    b. There is no effect on length of code
    c. The code becomes very short
    d. Code becomes very easy to understand
28. In which traversal method, the recursive calls can be used to traverse a binary tree?
    a. In preorder traversal only

b. In inorder traversal only
c. In postorder traversal only
d. All of the given options

29. If we use doubly linked list to implement list then there is an issue of
a. Next pointer of first node and pre pointer of last node are NULL
b. Next pointer of first node and next pointer of last node are NULL
c. Pre pointer of first node and next pointer of last node are NULL
d. Pre pointer of first node and pre pointer of last node are NULL

30. In case of insertion of left outer node in BST,
a. We apply single right rotation to make it AVL tree.
b. We apply single left rotation to make it AVL tree.
c. We first apply right rotation and then left rotation to make it AVL tree.
d. We first apply left rotation and then right rotation to make it AVL tree.

31. Whenever we call a function, the complier makes a stack, the top element of the stack is _____ of the function.
a. First argument
b. Return address
c. Last argument
d. None of the above

32. Suppose a stack class has been defined using template. Now, we want to declare a Stack object of an int type. What will be the correct syntax?
a. <int>Stack stack;
b. Stack<int> stack;
c. Stack int stack;
d. Int Stack stack;

33. In node class one field is an integer data and other field will be _____
a. Pointer to class
b. Pointer to node
c. Pointer to integer
d. None of given options

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34. If there are 100,0000 unique members (nodes) stored in a complete binary tree, the tree will have _____ levels.
    a. 10
    b. 20
    c. 30
    d. 40
35. ~BinarySearchTree() is a _____.
    a. Constructor
    b. Destructor
    c. Switch case
    d. Template method call
36. _____ is utilized at the time of memory allocation in dynamic manner.
    a. Stack
    b. Queue
    c. Heap
    d. All of the given
37. How many cases of rotation are there in AVL tree?
    a. 2
    b. 4
    c. 6
    d. 8
38. A list is the collection of items of the _____
    a. May be of same or may be of different type
    b. Different type
    c. Same type
    d. None of the above
39. Int * i = new int[10]; Above given code will:
    a. Create an integer having value 10
    b. Allocate memory for 9 integers
    c. Allocate memory for 10 integers
    d. Create 10 pointers of integer type
40. The depth of a binary tree is
    a. Total number of nodes in the tree

b. Number of leaf nodes in the tree
c. Number of non-leaf nodes in the tree
d. Maximum level of a leaf

41. A _____ model attempts to model a real-world phenomenon
a. Physical
b. Logical
c. Simulation
d. Conceptual

42. In level-order traversal for binary search tree, we visit the nodes at each level before proceeding to the next level, in a _____ order.
a. Right-to-left
b. Left-to-right
c. Top-to-bottom
d. Bottom-to-top

43. The balance of a node in a binary tree is defined as the height of its _____ sub tree minus height of its right sub tree.
a. Right
b. Left
c. Upper
d. Lower

44. Allocating and de-allocating memory for linked list nodes does take _____ time than pre-allocated array.
a. Less
b. More
c. Equal
d. No

45. Consider we have performed the following operations on a stack of size 5. Push(10);
Push(20);
Push(30);
Pop();
Pop();
Pop();
Push(40);
Push(50);

Pop();

After the completion of all operation, the top element in stack is _____.

a. 10
b. 20
c. 40
d. 50

46. Each operator in a postfix expression refers to the previous _____ operand(s).

a. One
b. Two
c. Three
d. Four

47. In doubly linked list a node consists of three parts:

a. 1 pointer and 2 objects
b. 2 pointers and 1 object
c. 3 objects
d. 3 pointers

48. For reference variables, _____ sign is used.

a. Ampersand
b. Asterisk
c. Sigma
d. Dollar

49. Which of the following data structure is linear type?

a. Stack
b. List
c. Queue
d. All of the above

50. The - - is a decrement operator in C++ that decreases the value of the operand by _____.

a. One
b. Two
c. Three
d. Four

51. Which of the following statement is correct for the variable "current- -"?

a. Current = current + 1
b. Current = current - 1
c. Current = current - 2
d. Current – 1 = current

52. When an executable program runs, it is loaded in the computer memory and becomes a _____.
a. Thread
b. .h file
c. Process
d. None of the above

53. start() method of list class is used to:
a. Moves the "current" pointer to very first element
b. Moves the "current" pointer to very last element
c. Moves the "current" pointer to one step after the first element of the array
d. Moves the "current" pointer to one step before the first element of the array

54. a * (b + c) – d is an example of _____ expression.
a. Infix
b. Prefix
c. Postfix
d. Alfix

55. In a program a reference variable, say x, can be declared as
a. int &x;
b. int *x;
c. int x;
d. none of the given options

56. We allocate memory dynamically by using _____ operator.
a. This
b. New
c. Increment
d. Decrement

57. Get(?) method of list class is used to:
a. Get element from the last position
b. Get element from the first position

c. Get element from the middle position
d. Get element at the given position

58. STL is a _____ that is a part of the official standard of C++.
a. C program file
b. .h file
c. .cpp file
d. Library

59. There are ____ cases for deleting a node from binary search tree.
a. 1
b. 2
c. 3
d. 4

60. In a list, tail() method of current pointer _____
a. Returns the last element of the "current" pointer
b. Moves the "current" pointer to the very first element
c. Moves the "current" pointer to the very last element
d. Returns the first element of the "current" pointer

61. Suppose we have been given the following data set for a queue:
37524
What will be the resultant queue if we call a front() method?
a. 7524
b. 37524
c. 75243
d. 5 2 4

62. Suppose we have been given the following data set for a queue:
7524
What will be the resultant queue if we call enqueue(3) method? Note that 7 is the front element whereas 4 is rear element of queue.
a. 7524
b. 37524
c. 75243
d. 5243

63. Maximum time that an insertion operation can take in AVL tree is _____. Here log stands for log to the base of 2.
a. Log (n)

b. 1.44 log (n)
c. 1.66 log (n)
d. Log (n+1)

64. _____ is when function is calling to itself.
a. Loop
b. Recursion
c. Iteration
d. Nested loop

65. Left, right, info, and parent are the operations of _____ data structure.
a. Stack
b. Tree
c. Queue
d. Linked list

66. Following is a keyword of C++
a. Del
b. Delete
c. Remove
d. Eliminate

67. The expression DE+H* is called _____
a. Prefix expression
b. Infix expression
c. Postfix expression
d. Hybrid expression

68. A software solution is said to be efficient if it solves the problem _____.
a. By using some extra resources
b. Within no time
c. By consuming more hardware resources
d. Within its resources constraints

69. Each node in a singly linked list contains two fields, one field called data field while other field contains:
a. Pointer to an integer
b. Pointer to character

c. Pointer to next node
d. Pointer to class

70. Each node in singly linked list contains _____
a. One pointer
b. Two pointers
c. No pointer
d. NULL pointer

71. Every AVL tree is a binary search tree.
a. True
b. False
c. Not in some cases
d. None of the given

72. In singly linked list "next" field of node contains:
a. Address of next node
b. Object of next node
c. Object of current node
d. Address of head node

73. Two common models of simulation are _____ and _____.
a. Circuit-based simulation and Event- based simulation
b. Circuit-based simulation and Time-based simulation
c. Time-based simulation and Event- based simulation
d. None of the above

74. Stack and Queue can be implements using _____.
a. Singly Link List
b. Binary Tree
c. Binary search Tree
d. AVL Tree

75. What are the basic things associated with data structures?
a. Space for each data item it stores
b. Time to perform each basic operation
c. Programming effort
d. All of the above

76. In AVL tree insertion occurs on the inside in case ____ and 3 which a single rotation cannot fix.
a. 1
b. 2
c. 4

d. 5

77. add(12) method of linked list class will
a. Add 12 nodes in linked list
b. Add 12 pointers in linked list
c. Add 12 as value in linked list
d. Add 12 values in linked list

78. Which of the following is a non- linear data structure?
a. Stack
b. Queue
c. Tree
d. Linked list

79. Which data structure allows deleting data elements from front anf inserting at rear?
a. Stacks
b. Queues
c. Deques
d. Binary search tree

80. Array cells are ____ in computer memory.
a. Contiguous
b. Random
c. Store in multiple Variables
d. Store in multiple functions

81. A kind of expression where the operator is present between two operands called ____expressions.
a. Infix
b. Postfix
c. Prefix
d. None of the above

82. back() method of list class is used to
a. Moves the "current" pointer to backward one element.
b. Moves the "current" pointer to backward two element.
c. Moves the "current" pointer to backward three element.
d. Moves the "current" pointer to backward four element.

83. next() method of List class is used to:
a. Moves the Current position backward one element

b. Moves the "Current" pointer to two steps after the last element of the array
c. Moves the Current position forward one element
d. Moves the "Current" pointer to two steps before the last element of the array

84. _____tree has been named after two persons Adelson-Velskii and Landis.
a. Binary
b. Black
c. AVL
d. VLA

85. There are four cases of rotation in an _____ tree.
a. ELV
b. EVL
c. AVL
d. ALV

86. _____ is used for reference variable in C++.
a. !
b. @
c. #
d. &

87. A _____ is a tree in which every level, except possibly the last, is completely filled, and all nodes are as far left as possible.
a. Strict binary tree
b. Full binary tree
c. Perfect binary tree
d. Complete binary tree

88. A queue is a data structure where elements are
a. Inserted at the front and removed from the back
b. Inserted and removed from the top
c. Inserted at the back and removed from the front
d. Inserted and removed from both ends

89. Longest path from root node to farthest leaf node is called _____ of tree.
a. Level
b. Length

c. Depth
d. Node level

90. New items are added at the _____ of the stack.
a. Bottom
b. Middle
c. Center
d. Top

91. Length() method of list class is used to:
a. Return the length of the array
b. Return the length of the list
c. Return the length of empty part of the array
d. Return the length of empty part of the list

92. The function calls are made with the help of _____.
a. Stack
b. Heap
c. Dynamic memory
d. External memory

93. An efficient program execute faster and helps in _____ the usage of resources like memory and disk
a. Maximizing
b. Minimizing
c. Equalizing
d. None of the given

94. Generalized code written for a class is called:
a. Function
b. Template
c. Structure
d. Stack

95. "set()" method of list class is used to:
a. Set the value of Pointer
b. Set the value of Null Nodes
c. Set the value of objects
d. Set the value of Value

96. In C++, we place the class interface in ___ file.
a. .cpp
b. .cppp

c. .h
d. .hh

97. Every _____ tree is a binary search tree.
a. AVL
b. binary
c. big
d. small

98. If both left and right nodes of a node are NULL then this type of node is called ____ node.
a. Non leaf
b. internal
c. inner
d. leaf

99. Which of the following function don't belongs to the stack class?
a. push()
b. pop()
c. crash()
d. top()

100. For a complete binary tree, the depth is calculated as____
a. log2(number of nodes+1)-1
b. log2(number of nodes*1)+1
c. log2(number of nodes-1)-1
d. log2(number of nodes-1)+1

101. ___ only removes items in reverse order as they were entered
a. Queue
b. Stack
c. Both of these
d. None of these

102. What will be the postfix expression of following infix expression? D+E*F/G
a. DE*F/G
b. DE+F*G/
c. DEF*/+
d. DE+FG*/

103. The _____ of a node in a binary tree is defined as the height of its _____ sub tree minus height of its right sub tree.
a. Height

b. Balance
c. Width
d. None

104. The back() method decreases the value of Variable current by____
a. Four
b. Three
c. Two
d. One

105. In doubly linked list there is/are_____pointer/s in each node.
a. One
b. Two
c. Three
d. Four

106. Suppose we have the following values to be inserted in constructing AVL tree,
10, 13, 15, 5, 7, 8
Tell when first rotation will take place.
a. After inserting node 13
b. After inserting node 15
c. After inserting node 5
d. After inserting node 7

107. Binary search algorithm cannot be applied to ___
a. Sorted linked list
b. sorted binary trees
c. sorted linear array
d. None of given option

108. During the execution of a process operating system constructs focus things for that process which of the following is not part of that process
a. A section for static data including global variable
b. Stack
c. Heap
d. Linked list

109. Which one of the following method does not change the original value of the argument in the calling function?
a. Call by passing reference of the argument

b. Call by passing the address of the argument
c. Call by passing the value of the argument
d. None of the given options

110. _____ is the major factor to see the efficiency of a program.
a. Quality
b. Time
c. Correctness
d. None of the given

111. While implementing stack with an array and to achieve LIFO behavior, we used push and pop elements at _____.
a. The start of the array
b. The end of the array
c. The mid of the array
d. At least one position before array starting index.

112. A template is a function or class that is written with a _____
a. Specific
b. Definite
c. Generic
d. None of the above

113. In the linked list implementation of the stack class, where does the push member function places the new entry on the linked list?
a. After all other entries that are greater than the new entry
b. At the head
c. After all other entries that are smaller than the new entry
d. At the tail

114. The next field in the last node in a singly-linked list is set to _____.
a. 0
b. 1
c. NULL
d. False

115. Consider the linked list having data [6, 72, 35, 65,25] stored in it. While current pointer is pointing memory location having 72 stored in it. After calling remove() function on the following linked list current point will point to memory location having value?

a. 6
b. 35
c. 65
d. 25

116. If we write functions for recursive and non recursive inorder traversal method of BST, what will be the difference between its functions prototypes?
a. Different return types
b. Different function names
c. Different arguments list
d. Nothing will be different

117. In singly linked list a node comprises of _____ field/s.
a. One
b. Two
c. Three
d. Four

118. Doubly linked list always has _____ NULL pointers in a node.
a. One
b. Two
c. Three
d. Four

119. A BST generated from the data in ascending order is _____.
a. Linear
b. Nonlinear
c. Balanced
d. Un sorted

120. Linked list is generally considered an example of _____ type of memory location.
a. Static
b. Compile time
c. Dynamic
d. None of given options

121. What's wrong with following loop?

```
while((i < 10) && (i > 24)){
}
```

a. The logical operator && cannot be used in a test condition
b. The while loop is an exit-condition loop

c. The test condition is always false
d. The test condition is always true

122. Making the tree unbalanced, it violates the _____ rule.
a. Linked list
b. Stack
c. AVL
d. Queue

123. copy() method of list data structure _____
a. copy first item of list
b. set one list to be a copy of another
c. copy last item of list
d. copy any item of list

124. Deleting a _____ node in BST is a _____ case.
a. Root, simplest
b. Left child, simplest
c. Right child, simplest
d. Leaf, simplest

125. We can not remove items randomly from _____
a. Stack
b. Queue
c. Both of these
d. None of these

126. NULL is an invalid address and _____.
a. Accessible
b. Inaccessible
c. Points to the start point of the list
d. Points to the last point of the list

127. A stack carries _____ behavior.
a. FIFO
b. LIFO
c. AVCO
d. FEFO

128. The tree data structure is a
a. Linear data structure
b. Non-linear data structure
c. Graphical data structure

d. Data structure like queue

129. Can we store elements with different data types in a single array?
a. Yes
b. No
c. In some cases
d. None of given

130. The lifetime of a transient object can exceed that of application which is accessing it.
a. True
b. False
c. In some cases
d. None of the given

131. In a complete binary tree, for 25000 nodes the depth will be _____.
a. 13
b. 14
c. 15
d. 16

132. The smallest value element in a binary search tree(Each node with left and right pointer)
lies at
a. Root Node
b. Left Child of Root
c. Right Most Node
d. Left Most Node

133. if we use array to implement list, then there is an issue that is gives difficulty when
a. We will access values randomly
b. We will remove data from it
c. We will increase its size
d. We will decrease its size

134. if there are ___ nodes in an avl tree its levels will be roughly as log2(10 million)
a. 100 million
b. 10 million
c. 5 million

d. 2 million

135. Which one is the correct function call for the following function of calculatincube?

```
int cube(int&num)
{
.
.
.
```

a. Cube(&num)
b. Cube(&&num)
c. Cube(*num)
d. Cube(num)

136. Which of the following is the correct option for priority Queue?

a. The type of Queue that is not FIFO i.e the person who comes first may not leave first
b. The type of Queue that is not FIFO i.e the person who comes first should leave first
c. The type of Queue that is not FIFO i.e the person who comes first should leave first
d. The type of Queue that is not FIFO i.e the person who comes first may not leave first

137. For String-based Binary Search Tree, We use ASCII values of characters for comparing among letters. This method is known as ___

a. Lexicographic order
b. Alphabet coding procedure
c. Asymmetric technique
d. heap-based approach

138. Elements in a queue data structure are added from___ and remove from___ .

a. Rear end. front end
b. Front end. Rear end
c. Front end
d. rear end

139. If numbers 5,222,4,48 are inserted in a queue. Which one will be remove first?

a. 48
b. 4
c. 222
d. 5

140. A zigzag rotation is performed. In Left-Left case of rotation in AVL tree.
a. True
b. False
c. In some cases
d. None of the above

141. During deletion of node from BST. if we found this node don't have in- order successor and predecessor. it means this node is____
a. Left Most node in the binary search tree
b. Right most node in the binary search tree
c. Root node
d. None of the given option

142. _____ rule applies for evaluating operators of same precedence in an expression
a. right to left
b. Cascading
c. Associative
d. None of the above

143. What will be result of following postfix expression?
123*+2–
a. 3
b. 4
c. 5
d. 10

144. The main use of AVL tree is:
a. Searching of data
b. Storing of data
c. Insertion of data
d. Security of data

145. y = &x[0];
In the above statement, we get the address of the fist location of the array x and store it in y.
Here “y” is:

a. rvalue
b. xvalue
c. lvalue
d. zvalue

146. what will be postfix expression of the following infix expression? Infix expression a+b*c-d
a. ab+c*d-
b. abc*+d-
c. abcd+*-
d. abc+*d-

147. Which of the following is the correct conversion of infix to postfix expression? Z+B-(D-H)/K
a. ZB+D-H-K/
b. ZB+DH-K-/
c. ZB+DH-K/-
d. ZB+DHK--/

148. Leaf node of binary search tree contains _____.
a. One null pointer
b. Three null pointers
c. Two null pointers
d. All of the given

149. A tree is an AVL tree if
a. Any one node ful fills tha AVL condition
b. At least half of the nodes fulfill the AVL condition
c. All the nodes fulfill the AVL condition
d. None of the given options

150. The _____ of a binary tree is the maximum level of its leaves (also called the depth).
a. Level
b. Width
c. Height
d. None of the above

151. Memory address is stored in
a. Address operator
b. Reference
c. Pointer
d. All of the given

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152. A binary tree is said to be a _____ binary tree if every non-leaf node in a binary tree has non-empty left and right sub trees.
   a. Complete
   b. Strictly
   c. AVL
   d. Perfect

153. "+" is a _____operator.
   a. Unary
   b. Binary
   c. Ternary
   d. None of the above

154. Which of the following a nonlinear tree
   a. Stack
   b. Que
   c. Tree
   d. Linked List

155. For every Process execute the last part of the Memory is for_____of the Program
   a. Data
   b. Code
   c. Stack
   d. Heap

156. While implement non recursive traversal for binary search tree we need to implement_____
   a. Que
   b. Stack
   c. Min heap
   d. Max Heap

157. Suppose we have the following values to be inserted in constructing AVL tree,
   20,23,25,10, 12,13
   Tell when first rotation will take place.
   a. After increasing Node 25
   b. After increasing Node 23
   c. After increasing Node 10
   d. After increasing Node 12

158. If a tree has a 50 Node then the total linked in the tree will be
   a. 55
   b. 51
   c. 50
   d. 49

159. The percolate down procedure will move the smaller value ___and Bigger value___
   a. Left, right
   b. Right, left
   c. Down, up
   d. Up, down

160. Circular Linked List Solve the problem of___pointer/method of the doubly link list.
   a) Remove
   b) Null
   c) Add
   d) Find

161. isEmpty() method of stack class will return true when.
   a) Stack is full
   b) Stack is Partially
   c) Stack is not empty or Null
   d) Stack is empty

162. "New int[11]" will allocate memory for___integers.
   a) 13
   b) 12
   c) 11
   d) 10

163. For searching a particular number in Binary Search Tree (if it is not present), the maximum number of comparisons will be _____ comparison at each level.
a) 1
b) 2
c) 3
d) 4

164. In singly linked list which node will keep track of starting position of the list.

a) Next Node
b) Previous Node
c) Head Node
d) Last Node

165. If we singly linked list to implement list, then there is an issue that it gives difficulty when we:

a) Move forward in the list
b) Move backward in the list
c) We will increase its size
d) We will decrease its size

166. Can we store elements with different data types in a single array?

a) Yes
b) No
c) In some cases
d) None of the given

167. During union by size method, which data structure is used to improve the balancing of tree?

a) Array
b) Stack
c) Linked List
d) Tree

168. The difference between a "Binary Tree (BT)" and a "Binary Search Tree (BST)" is that,

a) A BST has two children per node whereas a BT can have none, one or two children per node
b) In BST nodes are inserted based on the values they contain
c) In BT nodes are inserted based on the values they contain
d) There is no difference

169. The main use of AVL tree is:

a) Searching of data
b) Storing of data
c) Insertion of data
d) Security of data
e) The expression

170. if (! heap ->isEmpty()) checks

a) Heap is empty
b) Heap is full

c) Heap is not empty
d) Not a valid expression

171. A solution is said to be efficient if it solves the problem within its resource constraints i.e. hardware and time.

a) True
b) False

172. A queue where the dequeue operation does not depend upon FIFO, is called:

a) enqueue
b) simple queue
c) stack
d) priority queue

173. In simple or singly linked list there is/are _____ pointer/s in each node.

a) One
b) Two
c) Three
d) Four

174. Which one of the following statement is correct?

a) Array size is fixed once it is created
b) Link List size is fixed once it is created
c) Binary Search Tree size is fixed once it is created
d) AVL Tree size is fixed once it is created

175. Which of the is NOT true regarding the maze generation?

a) Randomly remove walls until the entrance and exit cells are in same set.
b) Removing a wall is the same as doing a union operation
c) Remove a randomly chosen wall if the cells it separates are already in same set
d) Do not remove a randomly chosen wall if the cells it separates are already in same set.

176. If Ahmad is cousin of Ali and Ali is cousin of Asad then Ahmad is also cousin of Asad. This statement has the following property

a) Reflexivity
b) Symmetry
c) Transitivity
d) All of the given

177. Stack and Queue can be implemented using _____.

a) Singly Link List
b) Binary Tree
c) Binary Search Tree
d) AVL Tree

178. A Linear Data Structure is the data structure in which data elements are arranged in a sequence or a linear list. Which of the following is Non Linear Data Structure?
a) Arrays
b) Linked Lists
c) Binary Search Trees
d) Stack

179. Recursive call of a function use _____ data structure.
a) Linked List
b) Queue
c) Stack
d) Table

180. The _____ of a node in a binary tree is defined as the height of its left subtree minus height of its right subtree.
a) Height
b) Balance
c) Width
d) None of the above

181. Which operation of queue data structure is used to get front element from the queue and then remove it from the queue?
a) enqueue()
b) dequeue()
c) front()
d) remove()

182. Suppose we have been given the following data set for a Queue.
7 5 2 4
What will be the resultant Queue if we call enqueue(3) method?
Note that 7 is the front element whereas 4 is rear element of queue.
a) 7 5 2 4
b) 7 5 2 4
c) 7 5 2 4 3
d) 5 2 4 3

183. In C++, we place the class interface in _____ file.
a) .cpp
b) .cppp

c) .h
d) .hh

184. The array in binary search is sub divided _____.

a) Once
b) Twice
c) N time
d) Untill a sublist is no more divisible

185. If unions are done by weight (size), the depth of any element is never greater than

a) log 3n
b) log2 n
c) n log2 n
d) log n*n

186. _____ in AVL is logarithmic.

a) Updating
b) Searching
c) Deletion
d) Insertion

187. What is the depth of any tree if the union operation is performed by height?

a) O(N)
b) O(N log N)
c) O(log N)
d) O(M log N)

188. Avl tree takes maximum _____ time to search an element.

a) 1.44 Log2n
b) Log2(n+n)
c) Log2(n+1)+1
d) 1.88 Log2n

189. Which of the following is correct about AVL Tree?

a) It is identical to BST except height of the left and right subtrees can differ by at least 1.
b) It is identical to BST except height of the left and right subtrees must differ by at least 1.
c) It is not identical to BST, it is totally different kind of tree.
d) It is identical to BST except height of the left and right subtrees can differ by at most 1.

190. "new int[11]" will allocate memory for _____ integers.

a) 10
b) 11
c) 12
d) 13

191. The _____ method of list data structure removes the element residing at the current position

a) Add
b) Next
c) Remove
d) Find

192. While implementing non-recusive traversal for Binary SearchTree, we need to implement _____ .

a) Queue
b) Stack
c) Min heap
d) Max heap

193. Doubly Linked List always has _____ NULL pointer/s in a node.

a) One
b) Two
c) Three
d) Four

194. For a perfect binary tree of height h, having N nodes, the sum of hights of nodes ia _____.

a) N - h - 1
b) N - 1
c) N - 1 + h
d) N - (h - 1)

195. If there are N elements in an array then the number of maximum steps needed to find an element using Binary Search is _____.

a) N
b) N2
c) Nlog2N
d) log2N

196. Here is a small function definition:

```
void f(int i, int &k)
{
i = 1;
```

k = 2;
}
Suppose that a main program has two integer variables x and y, which are given the value 0. Then the main program calls f(x,y); What are the values of x and y after the function f finishes?

a) Both x and y are still 0.
b) x is now 1, but y is still 0.
c) x is still 0, but y is now 2.
d) x is now 1, and y is now 2.

197. The worst case of searching in binary search tree (BST) is:

a) When the data inserted in BST is sorted
b) When the height of left sub-tree is greater than right sub-tree
c) When the height of right sub-tree is greater than left sub-tree
d) When the tree is balanced

198. What will be postfix expression of the following infix expression?

Infix Expression: a+b*c-d

a) ab+c*d-
b) abc*+d-
c) abcd+*-
d) abc+*d-

199. What is the hash function used in linear probing?

a) hi(x)=hash(x) mod table size
b) hi(x)=(hash(x) + f(i^2)) mod table size
c) hi(x)= (hash(x)+ f(i)) mod table size
d) hi(x)= X mod 17

200. Each operator in a postfix expression refers to the previous _____ operand(s)

a) One
b) Two
c) Three
d) Four

201. In the statement int& a=b;

a) a and b pointing to two different memory location
b) a and b are two different names of the same memory location
c) a and b are two different variable names
d) b hold the address of variable a

202. In 1990, Bill pugh proposed an enhancement on linked lists and the new data structure was termed as

a) Linked list
b) B-Tree
c) Skip list
d) Spelling checker

203. Which of the following statement is NOT correct regarding Table ADT?

a) In a table, the type of information in columns may be different.
b) A table consists of deveral columns known as entities
c) The row of a table is called a record
d) A major use of table is in databases where we build and use tables for keeping information

204. A binary tree of N nodes has _____ .

a) Log10 N levels
b) Log2 N levels
c) N / 2 levels
d) N x 2 levels

205. If the height of a perfect binary tree is 4. What will be the total number of nodes in it?

a) 15
b) 16
c) 31
d) 32

206. Which property of equivalence relation is satisfied if we say: Ahmad R(is related to) Ahmad

a) Reflexivity
b) Symmetry
c) Transitivity
d) All of the given

207. If ahmad is boss of ehsan and ehsan is boss of umer then ahmad is also boss of umer. The above mentioned relation is _____.

a) Reflexive
b) Symmetry
c) Transitive
d) None of the given

208. Which of the following statement is false?

a) Arrays are dense lists and static data structure
b) data elements in linked list need not be stored in adjecent space in memory

c) pointers store the next data element of a list
d) linked lists are collection of the nodes that contain information part and next pointer

209. Binary search algorithem cannot be applied to _____ .

a) Sorted linked list
b) sorted binary trees
c) sorted linear array
d) None of the given

210. Suppose there is an image segmented into pixels. Each pixel has _____ neighbour(s).

a) 0
b) 4
c) 8
d) 16

211. In singly linked list a node consists of two parts:

a) Object and structure
b) Two pointers
c) Two objects
d) Object and pointer

212. A hash function returns a _____ value.

a) Integer
b) Double
c) Float
d) Char

213. In a tree, we link the nodes in such a way that it _____ a linear structure.

a) does not remain
b) forms
c) reverses
d) remains

214. The principal benefit of a link list over a conventional array is that the order of the linked items may be____from the order that the data seems are stored in memory.

a) Different
b) Identical
c) Same
d) Equivalent

215. The Computer memory can be thought of as a/an.

a) List

b) Queue
c) Stack
d) Array

216. Before using the Pop method of a stack, the user must call the__method.
a) isFull()
b) push()
c) pop()
d) isEmpty()

217. A stack carries____behavior.
a) FIFO
b) FEFO
c) LIFO
d) AVCO

218. ___Method returns the top element of the stack without removing it.
a) Pop()
b) Front()
c) Push()
d) Top()

219. In Queue data structure element are removed from_____.
a) Pop
b) Push
c) Rear
d) Front

220. In Queue data structure element are full from_____.
a) Pop
b) Push
c) Rear
d) Front

221.

222. "end()" method of list performs its tasks in
a) Many Steps
b) Three Steps
c) One Steps
d) Two Steps

223. Linked List use____to store data.
a) Array
b) Variables

c) Linked Memory
d) 2-D Array

224. Complete the push method code of stack void push (int x) { A{____}=x}
a) Count++
b) Count—
c) ++count
d) –count

225. A template is a Function or Class that is Written a___data type.
a) Generic
b) None of These
c) Define
d) Specific

226. Trying to remove an element from an empty Stack is called____
a) Garbage Collection
b) Overflow stack
c) Empty collection
d) Underflow of Stack

227. Stack and Queue can be implemented using___
a) Binary Tree
b) Singly Linked List
c) AVL Tree
d) Binary Search Tree

228. A software solution is said to be efficient if it solves the problem.
a) With its resource constraints
b) With No Time
c) By Consuming more hardware resources.
d) By Using some extra resources.

229. we cannot remove items randomly from___
a) Stack
b) Queue
c) Stack and Queue
d) List

230. Stack push(15) will push 15 on___
a) Top of the Stack
b) Anywhere of the Stack
c) Middle of the Stack
d) Bottom of the Stack

231. Which of the following is the correct conservation from infix to postfix expression A*B+C/(E-F).

a) ABC*+EF-/
b) AB*CFE-/*
c) AB*C+EF/*
d) AB+C*E-F/

232. Convert the Given infix from 12+60-23 of expression in postfix form.

a) 12+60 23-
b) 12 60+ -23
c) -12 60 -23
d) None

233. Y=&x[0];

In the above statement, we get the address of the Locatio of the array x and store it in y. Here "Y" is;

a) Xvalue
b) Zvalue
c) Ivalue
d) Nvalue

234. Last Node in Circular Linked list Contains.

a) Maximum Two points
b) No Null Pointer
c) Atleast one Null pointer
d) None

235. Consider the linked list having data [6, 72, 35, 65,25] stored in it. While current pointer is pointing memory location having 72 stored in it. After calling add(4) function on the following linked list current point will point to memory location having value?

a) 36
b) 4
c) 72
d) 25

236. there is no such Node whose next filed is NULL which one of the given option support the statement

a) Linked List
b) Circular Link list
c) Array
d) Queue