Shriram Mantri Vidyanidhi Info Tech Academy

PG DAC C++ Question Bank

Q1. Linked link are not superior to STL vectors

a) True b) False

Q2. Deleting a node in a linked list is a simple matter of using the delete operator to free the node's memory

a) True b) False

Q3. The advantage of link list over array is

a) Link list can grow and shrink in size during the time
b) Less space is required for storing elements
c) Both 1 and 2 are correct
d) None of the above

Q4. Which one of the following algorithm is NOT an example of Divide and conquer technique

a) Quick Sort b) Merge Sort **c) Bubble Sort** d) Binary Search

Q5. The inorder traversal of some binary tree produces the sequence DBEAFC, and the postorder transversal of the same tree produced the sequence DEBFCA. Which of the following is correct preorder transversal sequence?

a) DBAECF b) ABEDFC **c) ABDECF** d) None of the above

Q6. How many cycles should be contained in a tree?

a) 0 b) At least 1 c) Any number d) None of the above

Q7. If graph G has no edges then corresponding adjacency matrix is

a) Unit matrix b) Zero matrix c) Matrix with all 1's **d) None of the above**

Q8. What is not true for linear collision processing?

a) It is easier to program b) It may include more collision

c) It requires space for links **d) All are true**

Q9. Algorithms can be represented in various ways EXCEPT

a) PROGRAMS b) FLOWCHARTS c) DECISION CHARTS **d) SPREADSHEET**

Q10. The element at the root of heap is

a) Largest **b) Depending on type of heap it may be smallest or largest**

c) Smallest d) None of the above

Q11. The end at which a new element gets added to queue is called

a) Front b) Rear c) Top **d) Bottom**

Q12.Stack can be represented using

a) Arrays **b) Arrays or linked list** c) Only linked list d) None of the above

Q13. A graph is said to be a tree, if it satisfies which of the properties:

a) If it is connected and there are no cycles in the graph.
b) If it is not connected and there are cycles in the graph
c) If it connected and there are cycles in the graph
d) None of the above

Q14. Hashing refers to the process of deriving

a) A record key from storage address **b) Storage address from a record key**
c) A floating-point code from a record key d) None of the above

Q15. The inorder traversal of some binary tree produces the sequence DBEAFC, and the postorder traversal of the same tree produced the sequence DEBFCA. Which of the following is a correct preorder traversal sequence?
a) DBAECF b) ABEDFC **c) ABDECF** d) None of the above

Q16. Which of the following is not an operation of queue, assuming that queue has items \`Q\` and \`X\`?
a) empty(Q) b) deque(Q,X) c) enque(Q,X) **d) push(Q,X)**

Q17. In an adjacency matrix parallel edges are given by
a) Similar columns b) Similar rows c) Not representable d) None of the above

Q18. A dynamic data structure where we can search for desired records in O(log2n) time is
a) heap b) binary search tree c) circularly linked list d) array

Q19. We can efficiently reverse a string using a
a) linear queue b) circular queue **c) Stack** d) doubly linked list

Q20. The five items: A, B, C, D and E are pushed in a stack, one after the other starting from A. The stack is popped four times and each element is inserted in a queue. Then two elements are deleted from the queue and pushed back on the stack. Now one item is popped from the stack. The popped item is.
a) A b) B c) C **d) D**

Q21. The memory address of the first element of an array is called
a. floor address b. foundation address c. first address **d. base address**

Q22. The memory address of fifth element of an array can be calculated by the formula
a. LOC(Array[5]=Base(Array)+w(5-lower bound), where w is the number of words per memory cell for the array
b. LOC(Array[5])=Base(Array[5])+(5-lower bound), where w is the number of words per memory cell for the array
c. LOC(Array[5])=Base(Array[4])+(5-Upper bound), where w is the number of words per memory cell for the array
d. None of above

Q23. Which of the following data structures are indexed structures?
a) linear arrays b) linked lists c) both of above d) none of above

Q24. Which of the following is not the required condition for binary search algorithm?
a) The list must be sorted
b) there should be the direct access to the middle element in any sublist
c)There must be mechanism to delete and/or insert elements in list
d) none of above

Q25. Which of the following is not a limitation of binary search algorithm?
a) must use a sorted array
b) requirement of sorted array is expensive when a lot of insertion and deletions are needed
c) there must be a mechanism to access middle element directly

d) binary search algorithm is not efficient when the data elements are more than 1000.

Q26. Two dimensional arrays are also called
a) tables arrays   b) matrix arrays   **c) both of above**   d) none of above

Q27. A variable P is called pointer if
a) P contains the address of an element in DATA.
b) P points to the address of first element in DATA
c) P can store only memory addresses
d) P contain the DATA and the address of DATA

Q28. Which of the following data structure can't store the non-homogeneous data elements?
a) Arrays   b) Records   c) Pointers   d) None

Q29. Before deleting an element from list we make sure that
a) it is an list   b) it is not a invalid list   c) **it is not an empty list**   d) it must be full.

Q30. Each data item in a record may be a group item composed of sub-items; those items which are indecomposable are called
a) elementary items   b) atoms   c) scalars   **d) all of above**

Q31. The difference between linear array and a record is
a) An array is suitable for homogeneous data but the data items in a record may have different data type
b) In a record, there may not be a natural ordering in opposed to linear array.
c) A record form a hierarchical structure but a linear array does not
d) All of above

Q32. 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

Q33. Binary search algorithm cannot be applied to
a) sorted linked list   b) sorted binary trees   c) sorted linear array   d) pointer array

Q34. When new data are to be inserted into a data structure, but there is no available space; this situation is usually called
a) underflow   **b) overflow**   c) housefull   d) saturated

Q35. The situation when in a linked list START=NULL is
a) underflow   b) overflow   c) housefull   d) saturated

Q36. Which of the following name does not relate to stacks?
a) FIFO lists   b) LIFO list   c) Piles   d) Push-down lists

Q37. Which of the following is two way list?

a) grounded header list b) circular header list
c) linked list with header and trailer nodes **d) none of above**

Q38. The term "push" and "pop" is related to the
a) array b) lists **c) stacks** d) all of above

Q39. A data structure where elements can be added or removed at either end but not in the middle
a) Linked lists b) Stacks c) Queues **d) Deque**

Q40. When inorder traversing a tree resulted E A C K F H D B G; the preorder traversal would return
a) FAEKCDBHG **b) FAEKCDHGB** c) EAFKHDCBG d) FEAKDCHBG

Q41. Which data structure allows deleting data elements from front and inserting at rear?
a) Stacks **b) Queues** c) Deques d) Binary search tree

Q42. Identify the data structure which allows deletions at both ends of the list but insertion at only one end.
a) Input-restricted deque b) Output-restricted deque c) Priority queues d) None of above

Q43. Which of the following data structure is non-linear type?
a) Strings b) Lists c) Stacks **d) None of above**

Q44. Which of the following data structure is linear type?
a) Strings b) Lists c) Queues **d) All of above**

Q45. To represent hierarchical relationship between elements, which data structure is suitable?
a) Deque b) Priority **c) Tree** d) All of above

Q46. A binary tree whose every node has either zero or two children is called
a) Complete binary tree b) Binary search tree **c) Extended binary tree** d) None of above

Q47. The depth of a complete binary tree is given by
a) Dn = n log2n b) Dn = n log2n+1 c) Dn = log2n **d) Dn = log2n+1**

Q48. When representing any algebraic expression E which uses only binary operations in a 2-tree,
a) the variable in E will appear as external nodes and operations in internal nodes
b) the operations in E will appear as external nodes and variables in internal nodes
c) the variables and operations in E will appear only in internal nodes
d) the variables and operations in E will appear only in external nodes

Q49. A binary tree can easily be converted into q 2-tree
a) by replacing each empty sub tree by a new internal node
b) by inserting an internal nodes for non-empty node
c) by inserting an external nodes for non-empty node
d) by replacing each empty sub tree by a new external node

Q50. When converting binary tree into extended binary tree, all the original nodes in binary tree are
a) internal nodes on extended tree b) external nodes on extended tree

c) vanished on extended tree d) None of above

Q51. The post order traversal of a binary tree is DEBFCA. Find out the pre order traversal
a) ABFCDE b) ADBFEC **c) ABDECF** d) ABDCEF

Q52. Which of the following sorting algorithm is of divide-and-conquer type?
a) Bubble sort b) Insertion sort **c) Quick sort** d) All of above

Q53. An algorithm that calls itself directly or indirectly is known as
a) Sub algorithm **b) Recursion** c) Polish notation d) Traversal algorithm

Q54. In a binary tree, certain null entries are replaced by special pointers which point to nodes higher in the tree for efficiency. These special pointers are called
a) Leaf b) branch c) path **d) thread**

Q55. The in order traversal of tree will yield a sorted listing of elements of tree in
a) Binary trees **b) Binary search trees** c) Heaps d) None of above

Q56. In a Heap tree
a) Values in a node is greater than every value in left sub tree and smaller than right sub tree
b) Values in a node is greater than every value in children of it
c) Both of above conditions applies
d) None of above conditions applies

Q57. In a graph if e=[u, v], Then u and v are called
a) endpoints of e b) adjacent nodes c) neighbors **d) all of above**

Q58. A connected graph T without any cycles is called
a) a tree graph b) free tree c) a tree **d) All of above**

Q59. In a graph if e=(u, v) means
a) u is adjacent to v but v is not adjacent to u b) e begins at u and ends at v
c) u is processor and v is successor **d) both b and c**

Q60. If every node u in G is adjacent to every other node v in G, A graph is said to be
a) isolated **b)complete** c) finite d) strongly connected

Q61. Two main measures for the efficiency of an algorithm are
a) Processor and memory b) Complexity and capacity **c) Time and space** d) Data and space

Q62. The time factor when determining the efficiency of algorithm is measured by
a) Counting microseconds **b) Counting the number of key operations**
c) Counting the number of statements d) Counting the kilobytes of algorithm

Q63. The space factor when determining the efficiency of algorithm is measured by
a) Counting the maximum memory needed by the algorithm
b) Counting the minimum memory needed by the algorithm

c) Counting the average memory needed by the algorithm
d) Counting the maximum disk space needed by the algorithm

Q64. Which of the following case does not exist in complexity theory
a) Best case   b) Worst case   c) Average case   **d) Null case**

Q65. The Worst case occur in linear search algorithm when
a) Item is somewhere in the middle of the array
b) Item is not in the array at all
c) Item is the last element in the array
d) Item is the last element in the array or is not there at all

Q66. The Average case occur in linear search algorithm
a) When Item is somewhere in the middle of the array
b) When Item is not in the array at all
c) When Item is the last element in the array
d) When Item is the last element in the array or is not there at all

Q67. The complexity of the average case of an algorithm is
a) Much more complicated to analyze than that of worst case
b) Much more simpler to analyze than that of worst case
c) Sometimes more complicated and some other times simpler than that of worst case
d) None or above

Q68. The complexity of linear search algorithm is
a) O(n)   b) O(log n)   c) O(n2)   d) O(n log n)

Q69. The complexity of Binary search algorithm is
a) O(n)   **b) O(log)**   c) O(n2)   d) O(n log n)

Q70. The complexity of Bubble sort algorithm is
a) O(n)   b) O(log n)   **c) O(n2)**   d) O(n log n)

Q71. The complexity of merge sort algorithm is
a) O(n)   b) O(log n)   c) O(n2)   **d) O(n log n)**

Q72. The indirect change of the values of a variable in one module by another module is called
a) internal change   b) inter-module change   **c) side effect**   d) side-module update

Q73. Which of the following data structure is not linear data structure?
a) Arrays   b) Linked lists   c) Both of above   **d) None of above**

Q74. Which of the following data structure is linear data structure?
a) Trees   b) Graphs   **c) Arrays**   d) None of above

Q75. The operation of processing each element in the list is known as
a) Sorting   b) Merging   c) Inserting   **d) Traversal**

Q76.Finding the location of the element with a given value is

a) Traversal
b) Search
c) Sort
d) None of above

Q77. Arrays are best data structures
a) for relatively permanent collections of data
b) for the size of the structure and the data in the structure are constantly changing
c) for both of above situation
d) for none of above situation

Q78. Linked lists are best suited
a) for relatively permanent collections of data
b) for the size of the structure and the data in the structure are constantly changing
c) for both of above situation
d) for none of above situation

Q80. Each array declaration need not give, implicitly or explicitly, the information about
a) the name of array
b) the data type of array
c) the first data from the set to be stored
d) the index set of the array

Q81. The elements of an array are stored successively in memory cells because
a) by this way computer can keep track only the address of the first element and the addresses of other elements can be calculated
b) the architecture of computer memory does not allow arrays to store other than serially
c) both of above
d) none of above

Q82. When is a linear queue said to be empty?
a) front > rear
b) front = = - 1
c) front > rear + 1
d) rear = = front + 1

Q83. Which of the following statement is true regarding stacks and queue?
i) In sequential representation, stack is logically as well as physically full
ii) Linear queue result in memory wastage as reuse of memory is not allowed.
iii) A Queue-full condition for a circular queue is 'rear=front + 1'
a) i & ii
b) i & iii
c) ii & iii
d) All.

Q84. Queue-full condition for the circular queue represented sequentially is?
a) front = = rear
b) rear + 1 + front
c) (rear+1)%arraysize = = front
d) None of the these

Q85. In a linked representation a node consists of which of the following fields?
a) Data, link, header
b) Only link field
c) Only data field
d) Data and link fields.

Q86. In case of a linked list
a) Arrays are used to hold the list
b) Every linked node has a link to the next node
c) Links have a array of pointer to the next link.
d) All of the above

Q87. The link field of last node, in a singly link list representation is linked with
a) The data field of the first node
b) The link field of the first node
c) A null
d) The link field of the prior node

Q88. Which of the following is not true regarding a singly linked list?

a) Nodes are linked in one direction
b) The last node is pointing to NULL indicating the end of list
c) Searching for a node always starts at the first node and traverses through every subsequent nodes
d) Address of the list is the address of the node

Q89. The header of main function which takes command line arguments looks like ___________
a) Int main(int argc, char *argv)   b) Int main(char *argv, int argc)
c) Int main(int argc, char *argv[])   d) Int main(char *argv[],int argc)

Q90. Using which macro, we can display the argument from variable number of argument function?
a) va_arg   b) va_list   c) va_show   d) va_start

Q91. what will be the output of the following program?

```
#include <stdio.h>
Int main()
{
        float arr[]={12.5,5.4,7.3,21.6,8.7};
        printf("%d\n",sizeof(arr)/sizeof(arr[0]));
        return 0;
}
```

a) 4   **b) 5**   c) 8   d) 20

Q92. What is the output of the following program?

```
Int main()
{
        Int j,sum;
        for( j=1, sum=0; j<5; j++)
                sum+=j;
                sum=j;
                cout<<sum;
                return 0;
}
```

a) 5   b) 10   c) Compilation error: undefined variable sum and j   d) 6

Q93. A program P reads in 500 integers in the range [0 to 100] representing the score of 500 students. It then prints the frequency of each score above 50. What would be the best way for P to store the frequencies?
a) An array of 50 numbers   b) An array of 100 numbers
c) An array of 500 numbers   d) A dynamically allocated array of 550 numbers

Q94. Which is true about reference variable?
a) A reference can never be null
b) A reference once established cannot be changed
c) Reference doesn't need an explicit dereferencing mechanism.
d) All of the above.

Q95. Dynamic objects are stored in
a) Code segment   b) Data segment   **c) Heap**   d) Run time stack

Q96. What is the output of the following code?

```
const int a=124;
```

```
void main()
{
	const int* Sample();
	int *p;
	p=Sample();
	cout<<*p;
}
const  int* Sample()
{
	return (&a);
}
```

a) Warning	**b) compilation error**	c) output : 124	d) garbage value

Q97. What is the size of pointer in C++ on 32 bit architecture?

a) 1	b) 2	**c) 4**	d) It depends on size of the datatype of a variable to which pointer is pointing to

Q98. Which are the main three features of OOP language?

a) Data Encapsulation, Inheritance and Exception handling
b) Inheritance , polymorphism and exception handling
c) Data encapsulation, inheritance and polymorphism
d) Overloading, inheritance and polymorphism

Q99. Which out of the given function types cannot be declared “virtual”?

a) Normal member functions	**b) Constructor**	c) Destructor	d) None of the above

Q100. Read the code carefully

```
class Base
{
	private:		int I;
	protected:		int j;
	public:		int k;
};
class Derived:public Base
{
	private:		int x;
	protected:		int y;
	public:		int  z;
};
```

sizeof(Base)= _____ bytes , sizeof(Derived) _______ bytes on a 32 bit architecture.

a)12 , 12	b) 12 , 16	**c) 12, 24**	d) 4 , 16

Q101. Static_cast can be applied at __________

a) Compile time	b) runtime	c) linking time	d) both a and b

Q102. Which inheritance type is used in the class given below?

```
Class A: public B: public C
{
}
```

a) multi-level   **b) multiple**   c) hybrid   d) hierarchical

Q103. Which of the following operators cannot be overloaded?

a) []   b) ->   c) ?:   d) *

Q104. Which of the following STL Container will store the elements in adjacent memory locations?

a) Vector   b) list   c) set   d) map

Q105. Which of the following statement is incorrect regarding inline functions?

a) It speeds up execution   **b) It slows down execution**

c) It increases the code size   d) A function can be inline without inline specifier.

Q106. Which of the following is not a member of class?

a) Static function   **b) friend function**   c) constructor   d) virtual function

Q107. In which operator overloading, compiler implicitly passes a dummy integer as an argument?

a) Post increment / decrement operator   b) Pre increment / decrement operator

c) Both the above   d) None of the above

Q108. Which of the following is correct statement regarding abstract class?

a) Abstract class object can't be created   b) Pointer to abstract class can be created

c) Reference to abstract class can be created   **d) All of the above**

Q109. During inheritance which of the following is not inherited?

a) Friend function   b) Constructor   c) Overloaded = operator   **d) All of the above**

Q110. What is the output of the following program?

```
class myclass
{
        public:
                static int counter;
};
void main()
{
        cout<<myclass::counter;
}
```

a) Output 0   b) Compilation error   **c) Linking error**   d) Output garbage value

Q111. What is the primary purpose of template function?

a) To allow a single function to be used with varying types of arguments

b) To hide the name of the function from the linker (preventing duplicate symbols)

c) To improve execution speed of the program

d) To enable better debugging

Q112. Which of the following data structure may give overflow error, even though the current number of element in it is less than its size?

a) Simple queue b) Circular queue c) Primary queue d) Stack

Q113. The most appropriate matching for the following pairs:

a) Bubble sort	1) O(nlog(n))
b) Insertion sort	2) O(n)
c) Quick sort	3) O(n^2)

a) a=1 b=2 c=3 b) a=3 b=1 c=2 c) a=3 b=2 c=1 d) a=2 b=3 c=1

Q114. In a binary tree, certain null entries are replaced by special pointers which point to nodes higher in the tree for efficiency. These special pointers are called ______

a) root b) node c) branch d) thread

Q115. a binary search tree whose left subtree and right subtree differ in height by at most one unit is called.

a) AVL tree b) Red-black tree c) Lemma tree d) None of the above

Q116. _____________ algorithm is not an example of divide and conquer rule.

a) Quick sort b) bubble sort c) merge sort d) binary search

Q117. Which of the following stack operations could result in stack underflow?

a) Push b) pop c) is_full d) none of the above

Q118. Which of the following sorting algorithm has the worst time complexity of nlog(n)?

a) Heap sort b) Insertion sort c) Selection sort d) Bucket sort

Q119. The number of binary trees with 3 nodes which when traversed in post order gives the sequence A, B , C is

a) 3 b) 5 c) 7 d) 9

Q120. A binary tree that has n leaf nodes, all at same level. The number of non-leaf nodes in such tree is

a) n-1 b) log(n) c) 2n d) 2n-1

Q121. Queue can be used to implement

a) Recursion b) Breadth- first search c) Depth – first search d) None of these

Q122. Which design pattern is used in Exception handling mechanism?

a) Chain of responsibility b) Interpreter pattern

c) Builder pattern d) Adapter pattern

Q123. Which design pattern you would use to limit the class instantiation to one object?

a) Factory method design pattern b) Builder design pattern

c) Prototype design pattern **d) Singleton design pattern**

Q124. The object which outlives the program execution time and exists between executions of the program is known as________________________

a) Global object **b) persistent object** c) transient object d) delegate object

Q125. Which design pattern you would use to translate an existing class interface into a compatible target interface?

a) Proxy design pattern **b) Adapter design pattern**
c) Façade design pattern d) Bridge design pattern

Q126. The adapter, bridge and composite design patterns are examples of _________

a) Creational pattern **b) Structural pattern**
c) Behavioral pattern d) Interaction pattern

Q127. Communication diagram, sequence diagram and timing diagram can all be categorized as _________

a) Behavior diagram b) Structure diagram c) Activity diagram d) Interaction diagram

Q128. Linked link are not superior to STL vectors

a) True b) False

Q129. Deleting a node in a linked list is a simple matter of using the delete operator to free the node's memory

a) True b) False

Q130. The advantage of link list over array is

a) Link list can grow and shrink in size during the time
b) Less space is required for storing elements
c) Both 1 and 2 are correct
d) None of the above

Q131. Which one of the following algorithm is NOT an example of Divide and conquer technique

a) Quick Sort b) Merge Sort **c) Bubble Sort** d) Binary Search

Q132. The inorder traversal of some binary tree produces the sequence DBEAFC, and the postorder transversal of the same tree produced the sequence DEBFCA. Which of the following is correct preorder transversal sequence?

a) DBAECF b) ABEDFC **c) ABDECF** d) None of the above

Q133. How many cycles should be contained in a tree?

a) 0 b) at least 1 c) any number d) None of the above

Q134. If graph G has no edges then corresponding adjacency matrix is

a) unit matrix **b) zero matrix** c) matrix with all 1's d) None of the above

Q135. What is not true for linear collision processing?

a) It is easier to program b) It may include more collision
c) It requires space for links **d) All are true**

Q136. In an adjacency matrix parallel edges are given by

a) Similar columns b) Similar rows c) Not representable d) None of the above

Q137. The element at the root of heap is

a) Largest
b) Smallest
c) Depending on type of heap it may be smallest or largest
d) None of the above

Q138. The end at which a new element gets added to queue is called

a) Front **b) Rear** c) Top d) Bottom

Q139. If we traverse a following tree in Pre order then what will be traversal

a) ABDGCEHIF b) ABDGHEICF c) ABDGFCIEH d) None of the above

Q140. A graph is said to be a tree, if it satisfies which of the properties

a) If it is connected and there are no cycles in the graph.
b) If it is not connected and there are cycles in the graph
c) If it connected and there are cycles in the graph
d) None of the above

Q141. Hashing refers to the process of deriving

a) A record key from storage address **b) Storage address from a record key**
c) A floating-point code from a record key d) None of the above

Q142. The inorder traversal of some binary tree produces the sequence DBEAFC, and the postorder traversal of the same tree produced the sequence DEBFCA. Which of the following is a correct preorder traversal sequence?

a) DBAECF b) ABEDFC c) ABDECF d) None of the above

Q143. What is not true for linear collision processing?

a) It is easier to program b) It may include more collision
c) It requires space for links **d) All are true**

Q144. In an adjacency matrix parallel edges are given by

a) Similar columns b) Similar rows c) Not representable d) None of the above

Q145. What is the output of the following program?

```
#include<iostream>
using namespace std;
enum test
{
        A=32,  B  , C;
};
int main()
{
        cout<<A<<”,”<<B<<”,”<<C;
        return 0;
}
```

a) 32 , 32 , 32 **b) 32 ,33 , 34** c) 32, 31 , 30 d) None of the above

Q146. A dynamic data structure where we can search for desired records in O(log2n) time is

a) heap b) binary search tree c) circularly linked list d) array

Q147. We can efficiently reverse a string using a

a) linear queue b) circular queue **c) stack** d) doubly linked list

Q148. Deleting a node in a linked list is a simple matter of using the delete operator to free the node's memory.

a) True b) False

Q149. The inorder traversal of some binary tree produces the sequence DBEAFC, and the postorder traversal of the same tree produced the sequence DEBFCA. Which of the following is a correct preorder traversal sequence?

a) DBAECF b) ABEDFC **c) ABDECF** d) None of the above

Q150. What is not true for linear collision processing?

a) It is easier to program b) It may include more collision
c) It requires space for links **d) All are true**

Q151. In an adjacency matrix parallel edges are given by

a) Similar columns b) Similar rows c) Not representable d) None of the above

Q152. Suppose the numbers 6, 4, 2,9,5,7,0,3,1 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the inorder traversal sequence of the resultant tree?

Select one:

a) 7 9 6 1 0 3 2 5 4 b) 1 0 3 2 5 4 7 9 6 c) 7 9 0 1 2 3 4 5 6 d) 0 1 2 3 4 5 6 7 9

Q153. Two main measures for the efficiency of an algorithm are

a) Data and space. b) Processor and memory
c) Complexity and capacity **d) Time and space**

Q154. The complexity of the average case of an algorithm is

a) Much more complicated to analyze than that of worst case
b) Much more simpler to analyze than that of worst case
c) Sometimes more complicated and some other times simpler than that of worst case
d) None or above

Q155. The time factor when determining the efficiency of algorithm is measured by

a) Counting microseconds **b) Counting the number of key operations,**
c) Counting the number of statements d) Counting the kilobytes of algorithm

Q156. The space factor when determining the efficiency of algorithm is measured by

a) Counting the maximum memory needed by the algorithm
b) Counting the minimum memory needed by the algorithm
c) Counting the average memory needed by the algorithm
d) Counting the maximum disk space needed by the algorithm

Q157. Which of the following case does not exist in complexity theory

a) Best case b) Worst case c) Average case **d) Null case**

Q158. The running time of insertion sort is

a) O(n log n) b) O(log n) c) O(n) **d) O(n^2)**

Q159. Which of the following sorting procedure is the slowest?

a) Quick sort b) Merge sort **c) Bubble sort** d) Heap sort

Q160. The correct order of the efficiency of the following sorting algorithms according to their overall running time comparisons is

a) bubble>selection>insertion **b) Insertion>selection>bubble**
c) Merge=Quick=Heap d) none above

Q161. A sort which iteratively passes through a list to exchange the first element with any element less than it and then repeats with a new first element is called

a) quick sort **b) selection sort**

Q162. The way a card game player arranges his cards as he picks them one by one can be compared to

a) Quick sort **b) Insertion sort** c) Selection sort d) Merge sort

Q163. Which among the following is the best when the list is already sorted

a) Merge sort b) Quick sort **c) Insertion sort** d) Selection sort

Q164. Which of the following sorting algorithm is of divide-and-conquer type?

a) Bubble sort b) Insertion sort **c) Quick sort** d) All of above

Q165. An algorithm that calls itself directly or indirectly is known as

a) Sub algorithm **b) Recursion** c) Polish notation d) Traversal algorithm

Q166. Representation of data structure in memory is known as:

a) recursive **b) abstract data type** c) storage structure d) file structure

Q167. An ADT is defined to be a mathematical model of a user-defined type along with the collection of all _____________ operations on that model.

a) Cardinality b) Assignment **c) Primitive** d) Structured

Q168. An algorithm is made up of two independent time complexities f (n) and g (n). Then the complexities of the algorithm is in the order of

a) f(n) x g(n) **b) Max (f(n),g(n))** c) Min (f(n),g(n)) d) f(n) + g(n)

Q169. As part of the maintenance work, you are entrusted with the work of rearranging the library books in a shelf in proper order, at the end of each day. The ideal choice will be

a) Bubble sort b) Quick sort **c) Insertion sort** d) Selection sort

Q170.The running time of merge sort can be recursively represented by

a) T(n)=2T(n/4)+n **b) T(n)=2T(n/2)+n** c) T(n)=2T(n/2)+2 d) T(n)=2T(n/3)+n

Q171.You have a sorted array and now you are given an element to be placed in that array so that the resulting array is also sorted, the best sorting technique in this case is

a) Bubble sort b) Selection sort **c) Insertion sort** d) Merge sort

Q172. The input to a merge sort is 6,5,4,3,2,1 and the same input is applied to quick sort then which is the best algorithm in this case

a) Merge sort b) Quick sort c) Cannot be decided

Q173. The memory available for storage is less, in this case if you want to sort the data which is the better approach amongst the following

a) Merge sort b) Quick sort **c) Heap sort** d) All

Q174. Arrange heap sort, merge sort and quick sort in the order of their space complexity

a) heap>merge>quick **b) quick<heap<merge** c) merge>quick>heap d) none

Q175. One of the reason why quick sort is better compared to other sorts is

a) its running time is O(n) **b) its space complexity is theta(log n),**

Q176. The running time of quick sort largely depends on

a) arrangement of elements **b) selection of pivot element** c) small list, d) none

Q177. The running time of heapify is given by

a) T(n) = T(2n/3) + Omega(1) b) T(n) = T(2n/2) , T(n) = T(2n) c) None

Q178. Which of the following statements are right about radix sort?

a) LSD radix sort is a stable sort b) MSD radix sort is a stable sort c) None.

Q179. LSD radix sort is applied on the following set of numbers: 21,86,124,33,29,163. What will be the order of numbers just before the MSD is considered?

a. (21,29,86,33,124,163) **b. (21,124,29,33,163,86)** c. (21,29,124,163,33,86)

Q180. The worst case time and worst case space complexity of radix sort is:

a) O(k*lg (N)) b) O(N^2) **c) O(k*N)**

Q181. The Worst case occur in linear search algorithm when

a) Item is somewhere in the middle of the array,
b) Item is not in the array at all
c) Item is the last element in the array,
d) Item is the last element in the array or is not there at all

Q182. The Average case occur in linear search algorithm

a) When Item is somewhere in the middle of the array.
b) When Item is not in the array at all.
c) When Item is the last element in the array.
d) When Item is the last element in the array or is not there at all.

Q183. Arrays are best data structures

a) For relatively permanent collections of data
b) for the size of the structure and the data in the structure are constantly changing
c) for both of above situation
d) for none of above situation

Q184. Each array declaration need not give, implicitly or explicitly, the information about

a) The name of array b) The data type of array
c) The first data from the set to be stored d) The index set of the array

Q185. Which of the following data structures are indexed structures?

a) linear arrays b) linked lists c) both of above d) none of above

Q186. Which of the following is not the required condition for binary search algorithm?

a) The list must be sorted, there should be the direct access to the middle element in any sub list
b) There must be mechanism to delete and/or insert elements in list
c) none of above

Q187. 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

Q188. Binary search algorithm cannot be applied to

a) sorted linked list b) sorted binary trees c) sorted linear array d) pointer array

Q189. The extra key inserted at the end of the array is called a,

a) End key. b) Stop key. **c) Sentinel.** D) Transposition.

Q190. The goal of hashing is to produce a search that takes

a) O(1) time b) O(n2) time c) O(log n) time d) O(n log n) time

Q191. The largest element of an array index is called its

a) lower bound. b) range. **c) upper bound.** d) All of these.

Q192. When new data are to be inserted into a data structure, but there is no available space; this situation is usually called

a) underflow **b) overflow** c) house full d) saturated

Q193. Which of the following is two way list?

a) grounded header list b) circular header list
c) linked list with header and trailer nodes **d) none of above**

Q194. Which of the following name does not relate to stacks?

a) FIFO lists b) LIFO list c) Piles d) Push-down lists

Q195. A data structure where elements can be added or removed at either end but not in the middle

a) Linked lists b) Stacks c) Queues **d) Deque**

Q196. Identify the data structure which allows deletions at both ends of the list but insertion at only one end.

a) Input-restricted deque b) Output-restricted deque
c) Priority queues d) None of above

Q197. Which of the following data structure is non-linear type?

a) Strings b) Lists c) Stacks **d) None of above**

Q198. What is the postfix form of the following prefix *+ab–cd

a) ab+cd–* b) abc+*– c) ab+*cd– d) ab+*cd–

Q199. The situation when in a linked list START=NULL is

a) underflow b) overflow c) house full d) saturated

Q200. Linked lists are best suited

a) for relatively permanent collections of data
b) for the size of the structure and the data in the structure are constantly changing
c) for both of above situation
d) for none of above situation

Q201. In list implementation, a node carries information regarding

a) the data b) the link c) the link and the data d) non above

Q202. The link field in the last node of the linked list contains

a) Zero value b) link to the first node
c) Pointer to the next element location d) all above

Q203. To delete a node at the beginning of the list, the location of the list is modified as the address of the.

a) second element in the list b) first element in the list
c) last element in the list d) no element

Q204. A linked list in which the last node points to the first is called a

a) Doubly linked list **b) Circular list** c) Generalized list d) reveres list

Q205. A doubly linked list facilitates list traversal in

a) Any direction b) Circular direction **c) Either direction** d) no direction

Q206. In the linked list representation of the stacks, the top of the stack is represented by

a) the_last node b) any of the nodes **c) first node** d) non above

Q207. Polynodes consists of three fields representing

a) Coefficient, exponential and link b) Coefficient, data item and the link
c) Previous item link, data item and next item link d) only exponential and link

Q208. Linked list data structure usage offers considerable saving in

a) Computational time b) Space utilization
c) Space utilization as well as computational time. d) all above

Q209. Whether a list is full or empty is given by the

a) The status operation b) The length of the list c) The size of the list d) zero value

Q210. To represent hierarchical relationship between elements, which data structure is suitable?

a) Deque b) Priority **c) Tree** d) All of above

Q211. The depth of a complete binary tree is given by

a) Dn = n log2n **b) Dn = n log2n+1** c) Dn = log2n d) Dn = log2n+1

Q212. When inorder traversing a tree resulted E A C K F H D B G; the preorder traversal would return

a) FAEKCDBHG **b) FAEKCDHGB** c) EAFKHDCBG d) FEAKDCHBG

Q213. The post order traversal of a binary tree is DEBFCA. Find out the pre order traversal

a) ABFCDE b) ADBFEC **c) ABDECF** d) ABDCEF

Q214. In a binary tree, certain null entries are replaced by special pointers which point to nodes higher in the tree for efficiency. These special pointers are called

a) Leaf b) branch c) path **d) thread**

Q215. The in order traversal of tree will yield a sorted listing of elements of tree in

a) Binary trees **b) Binary search trees** c) Heaps d) None of above

Q216. If every node u in G is adjacent to every other node v in G, A graph is said to be

a) isolated **b) complete** c) finite d) strongly connected

Q217. A binary tree of depth "d" is an almost complete binary tree if

a) Each leaf in the tree is either at level "d" or at level "d–1"

b) For any node "n" in the tree with a right descendent at level "d" all the left descendents of "n" that are leaves, are also at level "d"

c) Both a & b

d) None of the above

Q218. The degree of a node in a general tree can be

a) maximum two b) two **c) more than two** d) zero

Q219. In an ordered tree the left most son is the

a) oldest son b) youngest son c) left son d) None of the above

Q220. An element of a tree is called a

a) node b) root c) leaf

Q221. The node which gives rise to the branch node is called the

a) ancestor b) grandfather c) root node

Q222. Going from leaves to the root is called

a) traversing b) descending **c) climbing**

Q223. A binary tree in which every non-leaf node has non-empty right and left subtrees is said to be a

a) Strictly binary tree b) complete binary tree c) almost complete binary tree

Q224. In the inorder tree traversal the root is visited

a) before left subtree visit b) in between subtree visits c) before right subtree visit

Q225. In the sequential representation of binary tree implementation each node of the tree will have

a) no link field

b) info, left, right and father fields

c) three fields, data and the pointers to left and right subtrees.

Q226. An adjacency matrix representation of a graph cannot contain information of :

a) nodes b) edges c) direction of edges **d) parallel edges**

Q227. In Breadth First Search of Graph, which of the following data structure is used?

a) Stack. **b) Queue.** c) Linked List. d) None of the above.

Q228. The binary tree in which the descendent points to the ancestor is called?
a) linked tree **b) threaded tree** c) pointer tree

Q229. A binary tree whose every node has either zero or two children is called:
a) Complete Binary Tree b) Binary Search Tree
c) None of the Above d) Extended Binary Tree

Q230. What is the output of the following program?

```
 #include <iostream>
int main()
{
char arr[20];
int I;
for(i=0;i<10;i++)
*(arr+i)=65+I;
*(arr+i)=’\0’;
 cout<<arr;
  return(0);
}
```

Select one:
a) JJJJJJJJJJ b) ABCDEFGHIJ c) None of these d) AAAAAAAAAA

Q231. What is the running time of the following code fragment?

```
for (int i=0; i<10; i++)
   for (int j=0; j<N; J++)
    for (int k=N-2; k<N+2; K++)
      cout<<in<<” ”<<j<<end
```

a) O (log N) b) O (N) c) O (N^2) d) O (N log N)

Q232. The initial configuration of the queue is a, b, c, d (a is the front end).To get the configuration d, c, b, a one needs a minimum of?
a) 2 deletions and 3 additions b) 3 deletions and 4 additions
c) 3 deletions and 2 additions d) 3 deletions and 3 additions

Q233. What is the infix version of the following postfix expression? X12+z17Y +42*/+
a) x+12+z/ (17+y)*42 b) x+12+z ((17+y)*42
c) x+12+z/17+y*42 d) x+12+z)/ (17+Y*42)

Q234. Linked lists are not used in:
a) Linker b) OS c) None of these d) Compiler

Q235. The balance factor for an AVL tree are:
a) 0, 1, or -1 b) All of these c) 1, 2 or 3 d) 0, 1 or 2

Q236. Suppose we have the following class whose underlying data structure is a linked list of of List nodes.

```
class List{
public:
//other public functions
~List();
private:
struct Listnode{
int item;
List node *next;
};
ListNode*head;
};
```

Q237. Which of the following sequence of code could be used in the destructor~List () to correctly delete all of the nodes in the list? (Which ones are legal, even if the style is atrocious?)

```
I. for(ListNode*n=head;head!=NULL;head=n){
n=head->next;
delete head;
}
```

```
II. for (ListNode *n=head;n!=NULL;n->next){
delete n;
}
```

```
III. ListNode*n;
```

Q238. while(head!=NULL){

```
n=head->next;
delete head;
head=n;
}
```

a) I and II only b) III only c) II and III only d) and III only

Q239. Find the output of the following program?

```
Main ()
{
int x=20, y=35;
x=y+++x;
cout<<x<<y;
}
```

a) 56, 91 b) 55, 90 c) 57, 94 d) 57, 92

Q240. The numbers of swapping needed to sort the numbers 25,23,21,22,24 in ascending order using bubble sort is:

a) 12 b) 20 c) 6 d) 13

Q241. What is the expected time required to search for a value in a binary search tree containing n nodes? (You should make reasonable assumptions about the structure of the tree.)

a) O(log n) b) O(n) c) O(1) d) O(n log n)

Q242. The inorder and preorder traversal of a binary tree are a b c a f c e g and a b d e c f g, Respectively. The postorder traversal of the binary tree is :

a) d e b f g c a b) e d b g f c a c) e d b f c a d) d e f b c a

Q243. Which one is not a type of a queue:

a) Non-liner Queue b) Circular queue c) Deque d) Priority Queue

Q244. Consider the following C declaration

```
struct{
    short s[5]
      union{
      float y;
      long z;
       }u;
}t:
```

Q245. Assume the objects of type short, float and long occupy 2 byte, 4 byte and 8 byte respectively. The memory requirement for variable t ignoring alignment considerations is

a) 14 byte b) 22 byte c) 18byte d) 10byte

Q246. In a complete binary tree of ‘n‘ levels ,there are:

a) 2n-1leaves and 2n non-leaf nodes b) 2^n leaves and 2^n-1 non-leaf nodes
c) n^2leaves and n^2-1 non-leaf nodes d) 2^n-1leaves and 2^n non-leaf nodes

Q247. Which is not a sorting technique:

a) Merge sort b) Radix sort c) Quick sort d) Poll sort

Q248. The way a card game player arranges his cards as he picks them up one by one, is an example of

a) insertion sort b) merge sort c) selection sort d) bubble sort

Q249. Which one is the simplest data structure:

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

Q250. A class template in C++ has the following structure

```
template <class T> class TemplatedClass {
…
};
```

Q251. What is the meaning of T in the above program?

a) It must be an integer constant c) It is a string variable
b) It is a placeholder for a type name d) It is a placeholder for a pointer value

Q252. In double order traversal :

a) Every node is visited once b) Only root node is visited twice
c) Some node are visited twice d) Every node is visited twice

Q253. What is the output of the following?

```
#include<iostream>
using namespace std;
int main ()
{

  int i;
  char*art [] = {“C”,”C++”,”JAVA”,”VBA”};
char *(*ptr)[4] = &arr;
char<<++ (*ptr) [2];
  return 0;
}
```

a) Java b) C++ c) ava d) compile time error

Q254. In recursion which data structure is used:

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

Q256. Which of the following operators cannot be overloaded?

a) = b) -> c) :: d) ==

Q257. The postfix equivalent of the infix 4 $2*3-3+8/4(1+1)is

a) 42$3*3-8/411+/+ b) 42$3*3-84/11+/+
c) 42$33*-84/11+/+ d) 42$3*3-84/11++/