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Paper Code		
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(To be filled in the OMR Sheet)

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No. | | | | | | | | |

प्रश्नपुस्तिका सीरीज
Question Booklet Series
D

B.C.A.(Third Semester) Examination, February/March-2022

BCA-302(N)

Data Structure Using C & C++

Time : 1:30 Hours **Maximum Marks-100**

जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें

निर्देश : –

1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही– सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
2. **इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमे से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने है। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET)में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वांइट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा निर्धारित प्रश्नों से अधिक प्रश्नों के उत्तर दिये जाते हैं तो उसके द्वारा हल किये गये प्रथमतः यथा निर्दिष्ट प्रश्नोत्तरों का ही मूल्यांकन किया जायेगा।**
3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
5. ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक–पृथक उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
7. निगेटिव मार्किंग नहीं है।

महत्वपूर्ण : – **प्रश्नपुस्तिका खोलने पर प्रथमतः जॉच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभॉति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।**

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1. In a min-heap, element with the greatest key is always in the which node?

   (A) Leaf node

   (B) First node of right sub tree

   (C) First node of left sub tree

   (D) Root node

2. What will be the position of 70, when a min heap is constructed on the input elements 5, 70, 45, 7, 12, 15, 13, 65, 30, 25?

   (A) 70 can be anywhere in heap

   (B) 70 will be at second level

   (C) 70 will be at root

   (D) 70 will be at last level

3. In a binary min heap containing n elements, the largest element can be found in _____ time.

   (A) O(nlogn)

   (B) O(n)

   (C) O(1)

   (D) O(logn)

4. Which one of the following array elements represents a binary min heap?

   (A) B D E A S F T

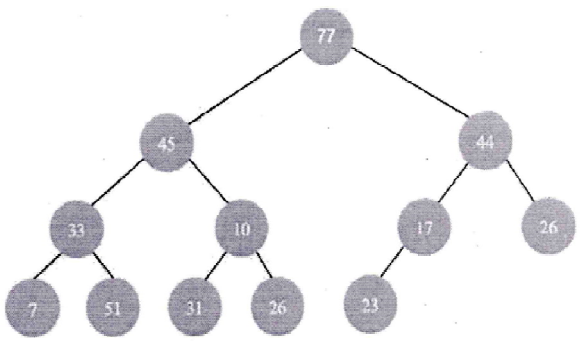
   (B) A B D E S F T

   (C) D B A E F S T

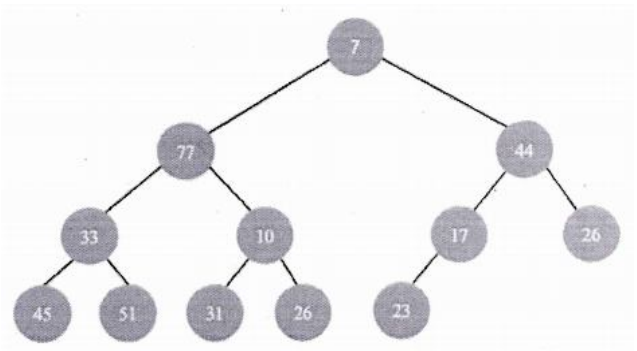
   (D) A E S B D T F

5. Which of the following is the valid min heap?

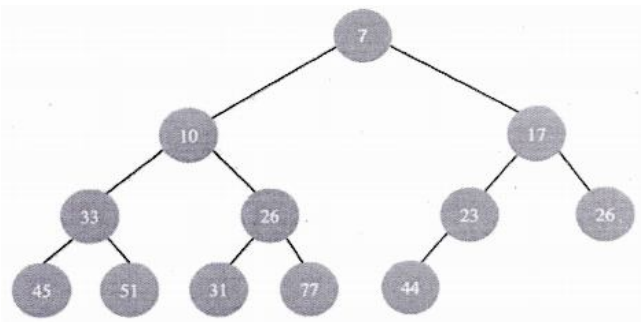
(A)



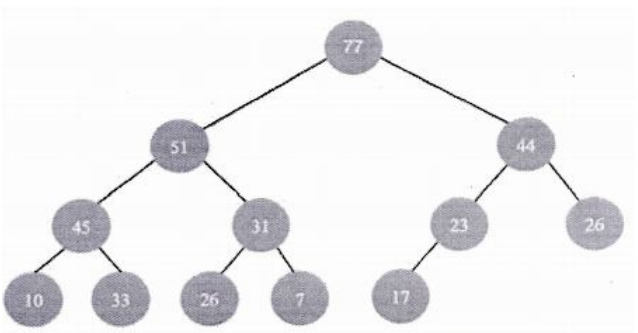
(B)



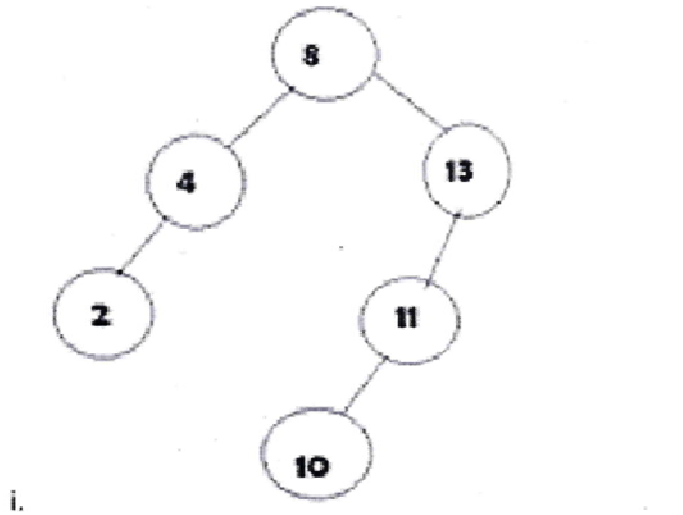
(C)



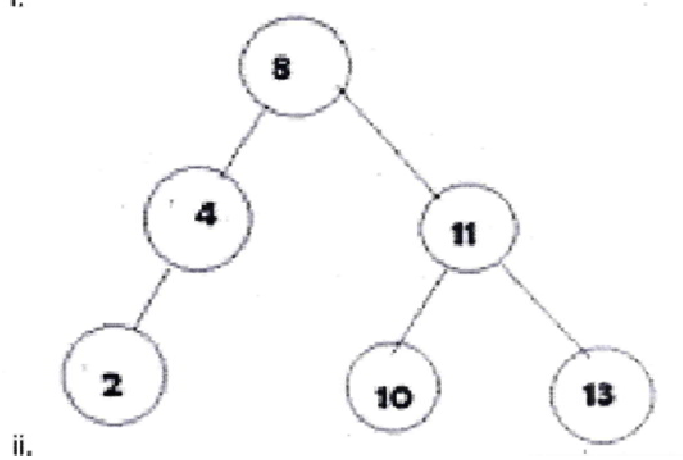
(D)



6. Which of the below diagram is following AVL tree property?



i.



ii.

(A) Only ii

(B) i is not a binary search tree

(C) Only i

(D) Only i and ii

7. Why we need to a binary tree which is height balanced?

(A) To simplify storing

(B) To Attain faster memory access

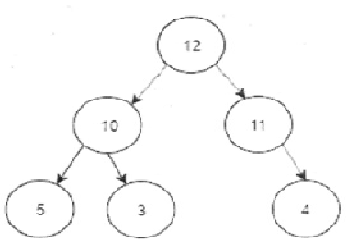
(C) To avoid formation of skew trees

(D) To Save memory

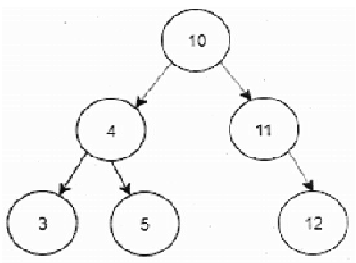
8. Construct a binary search tree with the below information.

The preorder traversal of a binary search tree 10, 4, 3, 5,11, 12.

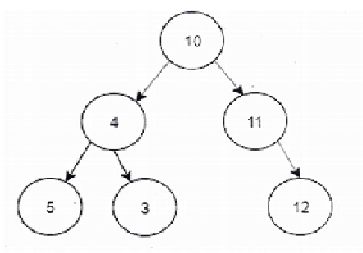
(A)



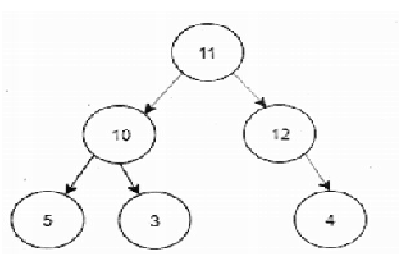
(B)



(C)



(D)



9. Which of the following is false about a binary search tree?

(A) The left and right sub-trees should also be binary search trees

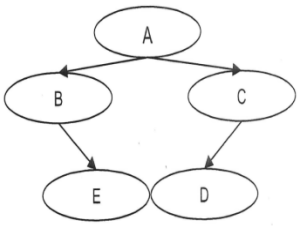
(B) In order sequence gives decreasing order of elements

(C) The left child is always lesser than its parent

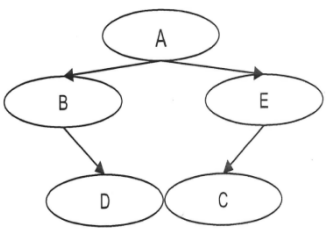
(D) The right child is always greater than its parent

10. Construct a binary tree using the following data the preorder traversal of a binary tree is A, B, E, C, D. The in-order traversal of the same binary tree is B, E, A,D, C.

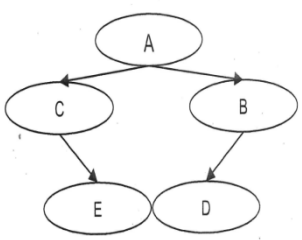
(A)



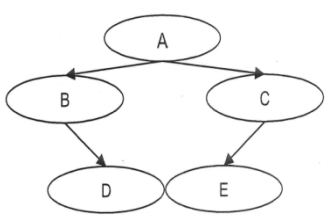
(B)



(C)



(D)



11. Which of the following properties are obeyed by all three tree-traversals?
    (A) Root node is visited before left sub-tree
    (B) Root node is visited before right sub-tree
    (C) Right sub-trees are visited before left sub-trees
    (D) Left sub-trees are visited before right sub-trees

12. If binary trees are represented in arrays, what formula can be used to locate a left child, if the node has an index i?
    (A) 2i
    (B) 4i
    (C) 2i+2
    (D) 2i+1

13. What operation does the following diagram depict?
    (A) Deleting a node with 2 children
    (B) Inserting an internal node
    (C) Inserting a leaf node
    (D) Deleting a node with 0 or 1 child
14. The following lines talks deleting a node in a binary tree. (the tree property must not be violated after deletion)
    i) From root search for the node to be deleted
    ii)
    iii) Delete the node at
    what must be statement ii) and fill up statement iii)
    (A) ii)- find deepest node, replace with node to be deleted iii)- delete a node
    (B) ii)- find deepest node, replace with node to be deleted. iii)- delete the deepest node
    (C) ii)- find node to be deleted. iii)- delete the node at found location
    (D) ii)- find random node replace with node to be deleted. iii)- delete the node
15. Disadvantages of linked list representation of binary trees over arrays?
    (A) Random access is not possible and extra memory with every element
    (B) Randomly accessing is not possible
    (C) Extra memory for a pointer is needed with every element in the list
    (D) Difficulty in deletion
16. A normal Queue, if implemented using an array of size MAX, gets full when?
    (A) Rear = Front
    (B) Front = Rear +1
    (C) Rear = MAX–1
    (D) Front = (Rear + 1) %MAX
17. If the elements "U", "X", "Y" and "Z" are placed in queue and are deleted one at a time, in what order will they be removed ?
    (A) UXZY
    (B) ZYXU
    (C) UXYZ
    (D) ZYUX

18. Here is an infix expression 6+7*(8*15–12). Suppose that we are using the usual stack algorithm to convert the expression from infix to postfix notation. The maximum number of symbols that will appear on a stack at one time during the conversion of this expression?

(A) 4

(B) 3

(C) 2

(D) 1

19. Which of the following is not the application of stack ?

(A) A parenthesis balancing program

(B) Data transfer between two asynchronous process

(C) Tracking of local variable at run time

(D) Compiler syntax analyzer

20. In a stack if the user tries to push an element in a filled stack is called_____.

(A) Underflow

(B) Empty Collection

(C) Overflow

(D) Garbage Collection

21. …… form of excess is used to add and remove nodes from a queue.

(A) LIFO, list in first out

(B) FIFO, First in First out

(C) Both (A) and (B)

(D) None of the above

22. What is not true about insertion sort?

(A) Exhibits the worst case performance when the initial array is sorted in reverse order

(B) Worst case and average case performance is O(n^2)

(C) Can we compared to the way a card player arranges is called from a card deck

(D) None of the above

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

(A) Storage Structure

(B) File Structure

(C) Abstract Data Types

(D) Recursive

24. Quick short running time depends on the selection of _____.

(A) Size of Array

(B) Pivot Element

(C) Sequence of Values

(D) None of the above

25. Recursion uses more memory space than iteration because_____.

(A) Every recursive call has to be stored

(B) It uses stack instead of queue

(C) Both (A) and (B) are true

(D) None of the above

26. The number of leaf nodes in a complete binary tree of height h is _____.

(A) 2h+1

(B) 2h+2

(C) 2h

(D) 2h–2

27. The data structure required to check whether an expression contains balanced parenthesis is _____.

(A) Array

(B) Tree

(C) Queue

(D) Stack

28. What kind of linked list begins with a pointer to the first node, and each node contains a pointer to the next nodes, and the pointer in the last node points back to the first node?

(A) Circular, Singly–Linked List

(B) Circular, Doubly– Linked List

(C) Singly –Linked List

(D) Doubly linked List

29. Which one of the below is not divide and conquer approach?

(A) Shell Sort

(B) Heap Sort

(C) Insertion Sort

(D) Merge Sort

30. Recursive procedures are implemented by using …… Data structures.

(A) Queues

(B) Linked Lists

(C) Stacks

(D) Strings

31. A full binary tree with n leaf nodes contains ……totalnodes.

(A) log2n Nodes

(B) 2n Nodes

(C) n+1 Nodes

(D) 2n+1 Nodes

32. The post fix form of – A^B*C-D+E/F (G+H)

(A) AB^CD-EP/GH+/+*

(B) AB^D+EFGH+//*+

(C) AB^C*D–EF/GH+/+

(D) ABCDEFGH+//+–*^

33. What value does the function my_code return when called with a value of 5?

```
Intmy_code(intnum)
{
If (num<=1)
return 1;
else
return num*my_code (num–1);
}
```

(A) 0

(B) 60

(C) 20

(D) 120

34. Linked list are not suitable data structures for which one of the following problem?

(A) Insertion Sort

(B) Radix Sort

(C) Binary Search

(D) Polynomial Manipulation

35. Which of the following type of expressions do not require precedence rules for evaluations?

(A) Postfix Expressions

(B) Partially parenthesized Infix Expressions

(C) Fully Parenthesized Infix Expressions

(D) More Than one of the above

36. The running time for creating a heap of size n is _____.

(A) O (nlog n)

(B) O (log n)

(C) O(n^2)

(D) O(n)

37. The time complexity of the quick short is:

(A) O(n)

(B) O(n^2)

(C) O (log n)

(D) O (nlog n)

38. A linear list in which each has pointer to point to the predecessor and successors nodes is called as_____.

(A) Circular Linked List

(B) Singly Linked list

(C) Doubly Linked list

(D) Linear Linked List

39. Each node in a link list has two pairs of _____and_____.

(A) Address field and link field

(B) Avail field and information field

(C) Information field and link field

(D) Link Field And Avail Field

40. _____is a directed tree in which out degree of each node is less than or equal to two.

(A) Binary tree

(B) Unary tree

(C) Trinary tree

(D) Both (A) and (C)

41. _____ is not an operation performed on linear list a) Insertion b) Deletion c) Retrieval d) Traversal

(A) Only (a), (b) and (c)

(B) Only (a) and (b)

(C) All of the above

(D) None of the above

42. Any node is the path from the root to the node is called:

(A) Internal Node

(B) Successor Node

(C) Ancestor Node

(D) None of the above

43. In a circular the value of index position I will be_____.

(A) i=i+1

(B) i= (i+1)% [QUEUE_SIZE– 1]

(C) i=(i-1)% QUEUE_SIZE

(D) i=(i+1)% QUEUE_SIZE

44. The number of comparison done by sequential search is _____.

(A) (N/2)+1

(B) (N – 1)/2

(C) (N+1)/2

(D) (N+2)/2

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

(A) Graph

(B) Tree

(C) Dequeue

(D) Priority

46. Identify the data structure which allows deletion at both ends of the list but insertion at only one end:

(A) Input Restricted Dequeue

(B) Output Restricted Deqeue

(C) Stack

(D) Priority Queue

47. Which data structure is used in breadth first search of a graph to hold notes?

(A) Array

(B) Stack

(C) Tree

(D) Queue

48. Which of the following data structure cannot store the non-homogeneous data element?

(A) Pointers

(B) Records

(C) Arrays

(D) Stacks

49. Which data structure allows deletion and insertion of data elements from different location?

(A) Stack

(B) Queues

(C) Binary Search Tree

(D) Graph

50. Which of the following is not the part of ADT description?

(A) Data

(B) Operation

(C) Both of the above

(D) None of the above

51. The simplest type of data structure is _____.

(A) Three dimensional array

(B) Two dimensional array

(C) Multidimensional array

(D) Linear array

52. Match the following:

a)	Completeness	i)	How long does it take to find a solution
b)	Time Complexity	ii)	How much memory need to perform the search.
c)	Space Complexity	iii)	Is the strategy guaranteed to find the solution when there in one.

(A) a-iii, b-ii, c-i

(B) a-i, b-iii, c-ii

(C) a-ii, b-i, c-iii

(D) a-iii, b-i, c-ii

53. For a binary search algorithm to work, it is necessary that the array (list) must be:

(A) None of the below

(B) In a Heap

(C) Unsorted

(D) Sorted

54. An algorithm is:

(A) All of the below

(B) A piece of code to be executed.

(C) A loosely written code to make final code.

(D) A step by step procedure to solve problem

55. Quick sort algorithm is an example of:

(A) Improved binary search

(B) Divide and conquer

(C) Greedy approach

(D) Dynamic Programming

56. A stable sorting algorithm:

(A) Does not run out of memory.

(B) Does not change the sequence of appearance of elements.

(C) Does not crash

(D) Does not exist

57. A balance factor in AVL tree is used to check:

(A) If the tree is unbalanced.

(B) If all child nodes are at same level

(C) What rotation to make

(D) When the last rotation occurred.

58. Tower of Hanoi is a classic example of:

(A) Recursive Approach

(B) Divide and Conquer

(C) Both (A)&(B)

(D) (B) but not (A)

59. Which of the following sorting methods would be most suitable for sorting a list, which is almost sorted:

(A) Quick Sort

(B) Bubble Sort

(C) Insertion Sort

(D) Selection Sort

60. The use of pointers to refer elements of a data structure in which elements are logically adjacent is_____.

(A) Pointers

(B) Linked allocation

(C) Queue

(D) Stack

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

(A) Linked lists

(B) Queues

(C) Stacks

(D) Dequeue

62. In a queue, the initial values of front pointer f and rear pointer r should be ……and …….Respectively.

(A) –1 and 0

(B) 1 and 0

(C) 0 and 1

(D) 0 and –1

63. The number of comparisons done by sequential search is _____.

(A) (N – 1)/2

(B) (N+2)/2

(C) (N/2) – 1

(D) (N+1)/2

64. Which of the following conditions checks available free space in avail list?

(A) Avail=Null

(B) Null=Avail

(C) Avail=Max stack

(D) Avail=Top

65. Binary search algorithm cannot be applied to_____.

(A) Sorted linked list

(B) Sorted binary trees

(C) Sorted linear array

(D) Pointer array

66. In a extended-binary tree nodes with 2 children are called_____.

(A) Interior node

(B) Domestic node

(C) Internal node

(D) Inner node

67. Deletion in the linked stack takes place by deleting_____.

(A) End of the list

(B) Node pointed by the start process.

(C) Beginning of the list

(D) Middle of the list

68. Before inserting into stack one must check the condition_____.

(A) Maximum elements

(B) Underflow

(C) Overflow

(D) Existing elements

69. In a binary tree a sequence of consecutive edges is called_____.

(A) Connecting lines

(B) Two-way

(C) Rotate

(D) Path

70. The pre-order and post order traversal of a Binary Tree generates the same output. The tree can have maximum:

(A) Any number of nodes

(B) Three nodes

(C) One node

(D) Two nodes

71. What data structure would you mostly likely see in a non-recursive implementation of a recursive algorithm?

(A) Queue

(B) Linked list

(C) Stack

(D) Trees

72. The quick sort algorithm exploit _____design technique.

(A) Dynamic programming

(B) Divide and Conquer

(C) Backtracking

(D) Overflow

73. In a linked list, insertion can be done as_____.

(A) Beginning

(B) Middle

(C) Anywhere

(D) End

74. …….is not the operation that can be performed on queue.

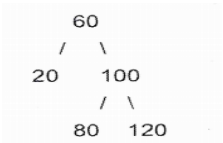
(A) Insertion

(B) Traversal

(C) Retrieval

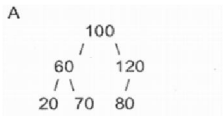
(D) Deletion

75. Consider the following AVL tree.

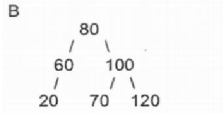


Which of the following is updated AVL tree after insertion of 70?

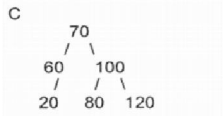
A



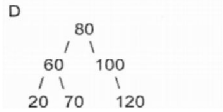
B



C



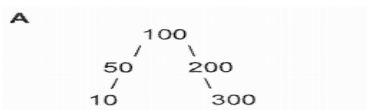
D



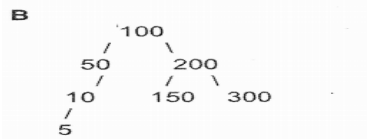
(A) D
(B) C
(C) B
(D) A

76. Which of the following is AVL Tree?

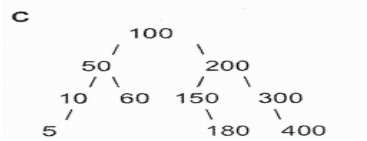
A



B



C



(A) A, B and C
(B) Only C
(C) B and A
(D) C and A

77. What is the maximum height of any AVL-tree with 7 nodes? Assume that the height of a tree with a single node is 0:

(A) 5

(B) 4

(C) 3

(D) 2

78. In delete operation of BST, we need in-order successor (or predecessor) of a node when the node to be deleted has both left and right child as non-empty. Which of the following is true about in-order successor needed in delete operation?

(A) In-order successor may be ancestor of the node

(B) In-order successor is always either a leaf node or a node with empty right child

(C) In-order Successor is always a leaf node

(D) In-order successor is always either a leaf node or a node with empty left child.

79. If arity of operators is fixed, then which of the following notations can be used to parse expressions without parentheses?

a) Infix Notation (In-order traversal of a expression tree)

b) Postfix Notation (Post-order traversal of a expression tree)

c) Prefix Notation (Pre-order traversal of a expression tree)

(A) a, b and c

(B) Only a

(C) Only b

(D) b and c

80. Consider the following nested representation of binary trees: (X Y Z) indicates Y and Z are the left and right sub stress, respectively, of node X. Note that Y and Z may be NULL, or further nested. Which of the following represents a valid binary tree?

(A) (A(B NULL D) (E F G))

(B) (A(BC NULL) (D E))

(C) (A B (D E F G))

(D) (A(B C D) E NULL) G)

81. Post-order traversal of a given binary search tree, T produces the following sequence of keys:

10, 9, 23, 22, 27, 25, 15, 50, 95, 60, 40, 29

Which one of the following sequences of keys can be the result of an in-order traversal of the tree T?

(A) 95, 50, 60, 40, 27, 23, 22, 25, 10, 9, 15, 29

(B) 29, 15, 9, 10, 25, 22, 23, 27, 40, 60, 50, 95

(C) 9, 10, 15, 22, 23, 25, 27, 29, 40, 50, 60, 95

(D) 9, 10, 15, 22, 40, 50, 60, 95, 23, 25, 27, 29

82. The preorder traversal sequence of a binary search tree is 3, 2, 1, 1.5, 2.5, 2.3, 3.9,3.5, 4.2 Which one of the following is the post-order traversal sequence of the same tree?

(A) 1.5, 2, 1, 2.3, 2.5, 4.2, 3.5, 3.9, 3

(B) 1.5, 1, 2.3, 2.5, 2, 3.5, 4.2, 3.9, 3

(C) 1, 2, 1.5, 2.3, 2.5, 3.5, 4.2, 3.9, 3

(D) 1.5, 1, 2.5, 2.3, 2, 4.2, 3.5, 3.9, 3

83. The following numbers are inserted into an empty binary search tree in the given order: 11, 0, 2, 4, 13, 12, 15.What is the height of the binary search tree (the height is the maximum distance of a leaf node from the root)?

(A) 5

(B) 4

(C) 2

(D) 3

84. Suppose the numbers 6, 4, 1, 8, 7,3, 2, 9, 0, 2 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 in-order traversal sequence of the resultant tree?

(A) 9 8 6 4 2 3 0 1 2 7

(B) 7 2 1 0 3 2 4 6 8 9

(C) 0 1 2 2 3 4 6 7 8 9

(D) 0 2 4 3 1 6 2 9 8 7

85. Which of the following traversal outputs the data in sorted order in a BST?

(A) Level-order

(B) Post-order

(C) Pre-order

(D) In-order

86. What are the main applications of tree data structure?

1) As a workflow for compositing digital images for visual effects.

2) Form of a multi-stage decision-making, like chess Game.

3) Router algorithms

4) Manipulate sorted lists of data

5) Manipulate Hierarchical data.

(A) 1, 2, 3, 4 and 5

(B) 1, 2, 3 and 4

(C) 1, 2, 3 and 5

(D) 1, 3, 4 and 5

87. Which of the following is a true about Binary Trees:

(A) Every complete binary tree is also a full binary tree.

(B) Every full binary tree is also a complete binary tree.

(C) Every binary tree is either complete or full.

(D) None of the above

88. An implementation of a queue Q, using two stacks S2 and S1, is given below:

```
void insert(Q, x) {
push(S2,x);
}
void delete(Q){
if(stack-empty(S1)) then
if(stack-empty(S2)) then {
print("Q is empty");
return;
}
else while(!(stack-empty(S2))){
x=pop(S2);
push(S1,x);
}
x=pop(S1);
}
```

Let n insert and n (<=m) delete operations be performed in an arbitrary order on an empty queue Q. Let a and b be the number of push and pop operations performed respectively in the process. Which one of the following is true for all n and m?

(A) 2n<=a<2mand 2n <=b <=2m
(B) 2n <=a<2m and 2m <=b<=n+m
(C) n+m<=a<2m and2n <=b<= n+m
(D) n+m<=a <2m and 2n<=b<= 2m

89. A Priority-Queue is implemented as a Min-Heap. Initially, it has 5 elements. The level-order traversal of the heap is given below:

2, 3, 5, 8, 10

Two new elements "1" and "7" are inserted in the heap in that order. The level-order traversal of the heap after the insertion of the elements is:

(A) 2, 3, 1, 5, 7, 8, 10
(B) 1, 3, 2, 8, 10, 5, 7
(C) 1, 3, 2, 7, 5, 8, 10
(D) 2, 3, 1, 10, 8, 5, 7

90. Suppose a circular queue of capacity (n-1) elements is implemented with an array of n elements. Assume that the insertion and deletion operation are carried out using REAR and FRONT as array index variables, respectively, Initially, REAR =FRONT =0. The conditions to detect queue full and queue empty are:

(A) Full: REAR==FRONT, empty: (REAR+1) mod n == FRONT
(B) Full: (FRONT+1) mod n ==REAR, empty: REAR== FRONT
(C) Full: (REAR+1) mod n ==FRONT, empty: REAR ==FRONT
(D) Full: (REAR+1) mod n == FRONT, empty: (FRONT+1) mod n == REAR

91. What does the following function do for a given linked List with first node as head?

```
Void fun 1(struct node*head )
{
if(head==NULL)
return;
fun1(head->next);
printf("%d ", head->data);
}
```

(A) Prints alternate nodes in reverse order.

(B) Prints alternate nodes of Linked List.

(C) Prints all nodes of linked lists.

(D) Prints all nodes of linked list in reverse order

92. Consider the following function to traverse a linked list.

```
void traverse(struct Node *head)
{
while (head->next!=NULL)
{
printf("%d", head->data);
head=head->next;
}
}
```

Which of the following is **FALSE**about above function?

(A) All of the Below.

(B) The function is implemented incorrectly because it changes head.

(C) The function may crash when the linked list is empty.

(D) The function doesn't print the last node when the linked list is not empty.

93. You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list?

(A) Delete the last element of the list.

(B) Add a new element at the end of the list.

(C) Delete the first element.

(D) Insert a new element as a first element.

94. Given pointer to a node X in a singly linked list. Only one pointer is given, pointer to head node is not given, can we delete the node X from given linked list?

(A) Possible if X is not first node. Use following two steps (a) Copy the data of next of X to X. (b) Delete next of X.

(B) Possible if X is not last node. Use following two steps (a) Copy the data of next of X to X. (b) Delete next of X.

(C) Possible if size of linked list is even.

(D) Possible if size of linked list is odd.

95. What are the time complexities of finding 4^{th} element from beginning and 4^{th} element from end in a singly linked list?

Let n be the number of nodes in linked list, you may assume that n >4:

(A) O(n) and O(n)

(B) O(1) and O(n)

(C) O(1) and O(1)

(D) O(n) and O(1)

96. In the worst case, the number of comparisons needed to search a singly linked list of length n for a given element is:

(A) log 2 n

(B) n

(C) log 2 n-1

(D) n/2

97. Which of the following sorting algorithms can be used to sort a fixed size Array with minimum time complexity?

(A) Radix Sort

(B) Heap Sort

(C) Bucked Sort

(D) Quick Sort

98. Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity?

(A) Insertion Sort

(B) Heap Sort

(C) Merge Sort

(D) Quick Sort

99. Which of the following points is/are true about Linked list data structure when it is compared with array?

(A) All of the below are correct.

(B) The size of array has to be pre-decided, linked lists can change their size any time.

(C) Arrays have better cache locality that can make them better in terms of performance.

(D) It is easy to insert and delete elements in linked list.

100. Which of the following is true about linked list implementation of stack?

(A) In push operation, if new nodes are inserted at the end, then in pop operation, nodes must be removed from the beginning.

(B) In push operation, if new nodes are inserted at the beginning of linked list, then in pop operation, nodes must be removed from end.

(C) In push operation, if new nodes are inserted at the Beginning, then in pop operation, nodes must be removed from the beginning.

(D) None of the above.

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