Dr.G.R.Damodaran College of Science

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CRISL rated 'A' (TN) for MBA and MIB Programmes

II B.Sc(Information Technology) [2016-2019]
Semester III
Core: Data Structures and Algorithms - 312A
Multiple Choice Questions.

1. A _____ is a well defined list for solving a particular problem.
   A. algorithm.
   B. complexity.
   C. time.
   D. space.
   ANSWER: A

2. Which data structure is used in breadth first search of a graph to hold nodes?
   A. Stack.
   B. Queue.
   C. Tree.
   D. Array.
   ANSWER: B

3. To represent hierarchical relationship between elements, Which data structure is suitable?
   A. Dequeue.
   B. Priority.
   C. Tree.
   D. Graph.
   ANSWER: C

4. There is an extra element at the head of the list called a_____.
   A. Antinel.
   B. Sentinel.
   C. List header.
   D. List head.
   ANSWER: C

5. Linked lists are best suited for _____.
   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
   ANSWER: B

6. The operation of processing each element in the list is known as _____.
   A. Sorting.
   B. Merging.
   C. Inserting.
   D. Traversal.
   ANSWER: D

7. In a extended-binary tree nodes with 2 children are called _____.
   A. Interior node.
   B. Domestic node.
   C. Internal node.
   D. Inner node.
   ANSWER: C

8. In a 2-tree, nodes with 0 children are called _____.
   A. Exterior node.
   B. Outside node.
   C. Outer node.
   D. External node.
   ANSWER: D

9. The depth of complete binary tree is given by _____.
   A. Dn = n log2n
   B. Dn= n log2n+1
   C. Dn = log2n
   D. Dn = log2n+1
   ANSWER: D

10. Linked representation of binary tree needs _____ parallel arrays.
   A. 4.
   B. 3.
   C. 2.
   D. 5.
   ANSWER: B

11. 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 more than 1500.
   ANSWER: D

12. The in-order traversal of tree will yield a sorted listing of elements of tree in _____.
   A. Threaded trees.
   B. binary search trees
   C. heaps
   D. binary heaps
   ANSWER: A

13. In fixed- length storage, all records have same number of _____.
   A. record.
   B. address.
   C. code.
   D. field.
   ANSWER: D

14. In variable length storage, two dollar signs are used to denote the _____.
   A. end of the string.
   B. beginning of the string.
   C. mid-level of the string.

D. index.
ANSWER: A

15. In linked storage, linearly ordered sequence of memory cells is called as_____.
A. link.
B. nodes.
C. thread.
D. list.
ANSWER: B

16. The _____ notation defines an upper bound function g(n) for f(n)which represents the space/time complexity of the algorithm.
A. Big Oh
B. Little Oh
C. Omega
D. Theta
ANSWER: A

17. In preorder traversal the root is processed _____.
A. first
B. second
C. third
D. randomly
ANSWER: A

18. 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.
ANSWER: C

19. 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 kilobytes of algorithm.
D. counting number of lines.
ANSWER: B

20. 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.
ANSWER: A

21. Which of the following case does not exist in complexity theory?
A. Best case.
B. Worst case.
C. Average case.
D. Null case.
ANSWER: D

22. 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 first element in the array.
ANSWER: B

23. Processing each element in list is called as _____.
A. Indexing.
B. Traversing.
C. Sorting.
D. Searching.
ANSWER: B

24. Finding the location of the element is called as_____.
A. traversing
B. searching.
C. concatenation.
D. indexing.
ANSWER: B

25. Combine two elements to a single list called as_____.
A. merging.
B. traversing.
C. searching.
D. sorting.
ANSWER: A

26. Arranging elements in some type of order _____.
A. merging.
B. traversing.
C. searching.
D. sorting.
ANSWER: D

27. A _____ is a list of finite number of homogeneous data elements.
A. linear array.
B. sequential array.
C. selection array.
D. pointer.
ANSWER: A

28. The free node linked list is also called as _____.
A. free pool.
B. empty pool.
C. unavailable list.
D. inaccessible list
ANSWER: A

29. _____ is a collection of related data items.
A. Record.
B. Attribute.
C. Field.
D. Identifiers.
ANSWER: A

30. The user defined names given to various data items are called as_____.
A. record.
B. attributes.
C. field.
D. identifiers.
ANSWER: D

31. _____ is a collection of similar records.
A. Records.
B. File.
C. Field.
D. Identifiers.
ANSWER: B

32. A record may be collection of _____ data.
A. homogeneous.
B. non-homogeneous.
C. sequential.
D. indexed.
ANSWER: B

33. Array elements are referenced by_____.
A. position.
B. pointer.
C. index set.
D. number.
ANSWER: C

34. Let the address of an array element be A[K],then K is called as the_____.
A. subscript.
B. subscripted variable.
C. bound.
D. index variable.
ANSWER: A

35. An m x n array has _____number of elements.
A. m.
B. n.
C. m2.
D. m x n.
ANSWER: D

36. The sequence (1,1.,(2,1.,(3,1.,(1,2.,(2,2.,(3,2.,....represents _____.
A. row major order.
B. column major order.
C. random order.
D. successive order.
ANSWER: B

37. Base address is the address of _____.
A. last element.
B. first element.
C. middle element.

D. pivot element.
ANSWER: B

38. Pointers stores _____of an element.
A. value.
B. address.
C. operation.
D. data.
ANSWER: B

39. Records can be represented using _____ in memory.
A. strings.
B. two dimensional arrays.
C. linear arrays.
D. parallel arrays.
ANSWER: D

40. A BST is traversed in the following order recursively: Right, root, left The output sequence will be in
A. Ascending order
B. Descending order
C. Bitomic sequence
D. No specific order
ANSWER: B

41. The first step of development of an algorithm is_____.
A. Problem analysis.
B. Problem statement.
C. Algorithm analysis.
D. Implementation.
ANSWER: A

42. Separating group items from sub items is called_____.
A. separation.
B. quantification.
C. qualification.
D. purification.
ANSWER: C

43. A linked list has _____ parts in each node.
A. two.
B. three.
C. four.
D. five.
ANSWER: A

44. The pointer of last node contains _____.
A. list pointer.
B. next pointer.
C. start.
D. null pointer.
ANSWER: D

45. Collection of deleted space onto free-pool is _____.

A. collection.
B. storage.
C. garbage collection.
D. tagging.
ANSWER: C

46. The situation that arises when trying to insert an item in linked list when free pool is empty is called _____.
A. underflow.
B. empty.
C. null.
D. overflow.
ANSWER: D

47. _____ is the situation where linked list is empty and trying to delete an item.
A. Overflow.
B. Underflow.
C. Null.
D. Empty.
ANSWER: B

48. Which of the following is true while inserting a new node in the list?
A. Check there is node in the list.
B. Check there is node in the free pool.
C. Check node in the list and free pool.
D. All the above.
ANSWER: B

49. Which of the following is true, while deleting a node from the list?
A. Check if there is node in the list.
B. Check in the free pool.
C. Check node in the list and free pool.
D. All the above.
ANSWER: A

50. Header linked list contains header node at the _____ of the list.
A. end
B. beginning
C. middle
D. second position
ANSWER: B

51. _____is the header list where last node contains null pointer.
A. circular header.
B. 2 way list.
C. linked list.
D. grounded header list.
ANSWER: D

52. _____ is the header list where last node points back to header node.
A. circular.
B. grounded.
C. linked.
D. 2-way.

ANSWER: A

53. The list which can be traversed forward & backward is _____ list.
A. circular
B. header
C. 2-way
D. grounded
ANSWER: C

54. _____ is an operation to add a new value.
A. Traversing.
B. Inserting.
C. Searching.
D. Looking.
ANSWER: B

55. Which of the following data structure can't store the non-homogeneous data elements?
A. Arrays.
B. Records.
C. Structure.
D. All of the above.
ANSWER: A

56. Which of the following is the best way to represent matrices?
A. linear arrays.
B. two dimensional arrays.
C. pointers.
D. structure.
ANSWER: B

57. In bubble sort algorithm, the condition flag=0 indicates that _____.
A. the list is not sorted.
B. there are no items in the list.
C. the items are interchanged.
D. the list is already sorted
ANSWER: D

58. 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 adjacent 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.
ANSWER: C

59. Binary search algorithm can not be applied to _____.
A. sorted linked list.
B. sorted binary trees.
C. sorted linear array.
D. pointer array.
ANSWER: A

60. LINK [START]=NULL in the grounded linked list indicates that the _____.
A. list is full
B. list is empty

C. list cannot store items
D. no space to insert items
ANSWER: B

61. START=NULL should be true for _____ to occur.
A. underflow.
B. overflow.
C. houseful.
D. saturated.
ANSWER: A

62. Which of the following is two way lists?
A. Grounded header list
B. Circular header list
C. Linked list with header, left pointer and right pointer nodes
D. Singly linked list.
ANSWER: C

63. Which of the following name does relate to stack?
A. FIFO lists.
B. LIFO list.
C. Files.
D. Circular list
ANSWER: B

64. A _____ is a list of elements in which an element may be inserted or deleted at only one end.
A. dequeue.
B. queue.
C. stack.
D. recursion.
ANSWER: A

65. _____ is the term used to delete an element from a stack.
A. Push.
B. Pop.
C. Queue.
D. Priority queue.
ANSWER: B

66. When the operator symbol placed before two operands, then the notation is called _____.
A. reverse polish.
B. postfix.
C. polish.
D. Prefix.
ANSWER: D

67. A _____ is a list of elements in which elements are inserted at one end and deletion at the other end.
A. dequeue.
B. queue.
C. stack.
D. recursion.
ANSWER: B

68. Queue is also called as _____.
A. FIFO.
B. LIFO.
C. SIRO.
D. RISO.
ANSWER: A

69. Which one of the following sequence can obtain the output using stack assuming that the input is 1,2,3,4,5?
A. 3,4,5,1,2.
B. 3,4,5,2,1.
C. 1,5,2,3,4.
D. 5,4,3,2,1.
ANSWER: D

70. A collection of elements in which the element has been assigned a priority_____.
A. priority queue.
B. stack.
C. deque.
D. queue.
ANSWER: A

71. FIFO is the short form of _____.
A. First In First Out.
B. First In Final Out.
C. Final In First Out.
D. Final In Final Out.
ANSWER: A

72. The term dequeue is a contraction of the name_____.
A. double ended queue.
B. single ended queue.
C. double queue.
D. single queue.
ANSWER: A

73. In executing the procedure PUSH, one must first test whether there is place in the stack for the stack new item; if not then we have the condition known as_____.
A. underflow.
B. overflow.
C. pop.
D. none.
ANSWER: B

74. A_____ operation into STACK is accomplished by inserting a node into the front or start of the list.
A. POP.
B. PUSH.
C. START.
D. none.
ANSWER: B

75. A pointer variable _____ contains the location of the top element of the stack.

A. MAXSTX.
B. TOP.
C. null.
D. BOTTOM.
ANSWER: B

76. The _____field of the nodes hold the data elements of the stack.
A. INFO.
B. LINK.
C. stack.
D. queues.
ANSWER: A

77. In executing the procedure POP ,one must test whether there is an element in the stack to be deleted, if not then the condition is known as_____.
A. stack.
B. recursion.
C. overflow.
D. underflow.
ANSWER: D

78. A _____operation is undertaken by deleting the node pointed to by the START pointer in stack.
A. MAXSTK.
B. POP.
C. LINK.
D. INFO.
ANSWER: B

79. The condition TOP=0 indicates _____.
A. stack is empty.
B. stack is full.
C. stack is unavailable.
D. stack overflows.
ANSWER: A

80. Recursion can be implemented by the use of _____ data structure.
A. stack.
B. queues.
C. link.
D. pointer.
ANSWER: A

81. The _____ is not a sorting algorithm.
A. quick sort.
B. binary search.
C. bubble sort.
D. heap sort.
ANSWER: B

82. Linear search is also called as _____.
A. consecutive search.
B. reverse search
C. sequential search.
D. binary search.

ANSWER: C

83. The address of the first and last element of each sub list called as_____.
A. push values.
B. pop values.
C. boundary values.
D. pointer.
ANSWER: C

84. Deletion in a queue occurs at _____ end.
A. front.
B. rear.
C. top.
D. both.
ANSWER: A

85. Insertion in queue takes place at the _____ end.
A. front.
B. rear.
C. push.
D. pop.
ANSWER: B

86. The _____ function is a function with two arguments each of which can be assigned any non negative integer.
A. Linear
B. Polynomial
C. Well defined
D. Ackermann
ANSWER: D

87. The length Li in a multidimensional arrays is calculated by using the formula _____.
A. Li =upper bound - lower bound + 1.
B. Li = upper bound + lower bound - 1
C. Li = upper bound - lower bound - 1.
D. Li = upper bound - lower bound.
ANSWER: A

88. In a circular queue the value of r will be _____.
A. r=r+1
B. r=(r+1)% [QUEUE_SIZE -1]
C. r=(r+1)% QUEUE_SIZE
D. r=(r-1)% QUEUE_SIZE
ANSWER: A

89. What will be the value of top, if there is a size of stack STACK_SIZE is 5?
A. 5
B. 6
C. 4
D. none
ANSWER: A

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

A. input-restricted dequeue.
B. output-restricted dequeue.
C. priority queues.
D. none of above.
ANSWER: A

91. The number of possible ordered trees with three nodes A,B,C is?
A. 11
B. 12
C. 13
D. 14
ANSWER: B

92. Which of the following data structure is linear type?
A. Tree.
B. Forest.
C. Queues.
D. None of the above.
ANSWER: C

93. Which data structure is suitable for representing hierarchical relationship between the elements?
A. Dequeue.
B. Linked lists.
C. Tree.
D. Array.
ANSWER: C

94. An expression is a collection of _____.
A. operands.
B. operators.
C. symbols.
D. operands and operators.
ANSWER: D

95. A binary tree T is defined as a finite set of elements called_____.
A. nodes.
B. arrays.
C. stacks.
D. terminal.
ANSWER: A

96. The nodes with no successor are called as_____.
A. successive nodes.
B. terminal node.
C. sub tree.
D. child.
ANSWER: B

97. The number of binary trees with 3 nodes which when traversed in postorder given the sequence A,B,C is _____.
A. 3.
B. 9.
C. 7.
D. 5.

ANSWER: D

98. A terminal node in a tree is called as _____.
A. leaf.
B. branch.
C. node.
D. root.
ANSWER: A

99. The path ending in a leaf of a tree is called as_____.
A. branch.
B. node.
C. pointer.
D. root.
ANSWER: A

100. Any invalid address is denoted by _____.
A. null.
B. pointer.
C. avail.
D. memory.
ANSWER: A

101. Matrices with a relatively high proportion of zero entries are called _____.
A. sparse matrices.
B. diagonal matrices.
C. triangular matrices.
D. zero order matrices.
ANSWER: A

102. Special pointers in a binary tree are called as_____.
A. threads.
B. tags.
C. nodes.
D. headers.
ANSWER: A

103. An elegant sorting algorithm that uses heap is called _____.
A. heap.
B. heap sort.
C. max heap.
D. quick sort.
ANSWER: B

104. The second matrix, where nonzero entries can only occur on the diagonal or on elements immediately above or below the diagonal is called a _____.
A. sparse matrix.
B. triangular matrix.
C. tridiagonal matrix.
D. zero-order matrix.
ANSWER: C

105. Tower of Hanoi is an example application for _____.
A. stack.

B. queue.
C. recursion.
D. linear list.
ANSWER: C

106. _____data structures combine the advantages of the sorted array and the linked list.
A. Sorted .
B. Linked tree.
C. Binary search tree.
D. Tree.
ANSWER: C

107. When the operator symbol is placed between its two operands the notation is called _____.
A. infix.
B. postfix.
C. prefix.
D. inter operator.
ANSWER: A

108. If s1 is left successor of node N and s2 is the right successor of node N then, N is _____of s1 and s2.
A. child.
B. grandchild.
C. parent.
D. descendant.
ANSWER: C

109. How many standard ways are there to traverse a binary tree?
A. one.
B. two.
C. three.
D. four.
ANSWER: C

110. The tree T is said to be _____ if all its levels, except possibly the last, have the maximum number of possible nodes, and if all the nodes at the last level appear as far left as possible.
A. weighted tree.
B. complete.
C. extended.
D. B-tree.
ANSWER: B

111. List of adjacency nodes, are also called as _____.
A. successors.
B. boundary.
C. edges.
D. root.
ANSWER: A

112. The root is processed before its subtrees in _____ traversal.
A. inorder.
B. preorder.
C. postorder.
D. all of the above.

ANSWER: B

113. The average running time f(n) to search an item in a binary tree T with n elements is _____.
A. O(n2).
B. O(log2n).
C. O(n).
D. O(n3).
ANSWER: B

114. The following sequence of operation is performed on stack :
push(1),push(2),pop,push(1),push(2),pop,pop,pop,push(2),pop. The sequence of popped out values are ?
A. 2,2,1,1,2
B. 2,2,1,2,2
C. 2,1,2,2,1
D. 2,1,2,2,2
ANSWER: A

115. Tree is a _____ structure.
A. linear.
B. non-linear.
C. circular.
D. pointer.
ANSWER: B

116. The number of swapping needed to sort numbers 8,22,7,9,31,19,5,13 in ascending order using bubble sort is ?
A. 11
B. 12
C. 13
D. 14
ANSWER: D

117. Binary trees with special pointers namely threads are called _____.
A. linked trees.
B. pointing trees.
C. extended trees.
D. threaded trees.
ANSWER: D

118. A tree T is called _____ , if each node N in T satisfies - the value at N is greater than every value in the left subtree of N and is less than the value in the right subtree of N.
A. binary search tree.
B. extended tree.
C. B-tree.
D. rooted tree.
ANSWER: A

119. _____ is the level number of the root node.
A. 1.
B. 0.
C. -1.
D. 5.
ANSWER: B

120. _____is the technique that is used to restore the balance of the search tree.
A. Rotations.
B. Resolutions.
C. Revolutions.
D. Recursions.
ANSWER: A

121. Which of the following data structure is used in retrieval and manipulation of data stored in external memory?
A. Binary search.
B. Quick sort.
C. m-way search trees.
D. Heap sort.
ANSWER: C

122. The _____ pointer of header node points the root node.
A. left.
B. right.
C. null.
D. node.
ANSWER: A

123. The pointer which replaces null entries pointing to higher nodes are _____.
A. next.
B. full.
C. high.
D. threads.
ANSWER: D

124. The complexity of linear search algorithm is _____.
A. O(n).
B. O(log n).
C. O(n2).
D. O(n log n).
ANSWER: A

125. The complexity of Binary search algorithm is _____.
A. O(n).
B. O(log2n).
C. O(n2).
D. O(n log n).
ANSWER: B

126. The complexity of Bubble sort algorithm is _____.
A. O(n).
B. O(log n).
C. O(n2).
D. O(n log n).
ANSWER: C

127. The complexity of merge sort algorithm is_____.
A. O(n).
B. O(log n).

C. O(n2).
D. O(n log n).
ANSWER: D

128. Which of the following linked list does not have any NULL links?
A. Single linked list.
B. Linear doubly linked list.
C. Circular linked list.
D. Two way linked list.
ANSWER: C

129. If yyy, xxx and zzz are the elements of a lexically ordered binary tree, then in preorder traversal which node will be traverse first?
A. xxx.
B. yyy.
C. zzz.
D. cannot be determined.
ANSWER: A

130. In a balance binary tree the height of two sub trees of every node can not differ by more than _____.
A. 2.
B. 1.
C. 0.
D. 3.
ANSWER: B

131. The result of evaluating prefix expression */b+-dacd, where a = 3, b = 6, c = 1, d= 5 is _____.
A. 0.
B. 5.
C. 10.
D. 15.
ANSWER: C

132. In an array representation of binary tree the right child of root will be placed at the _____ location.
A. second.
B. fifth.
C. third.
D. first.
ANSWER: C

133. The dummy header in linked list contains _____.
A. first record of the actual data.
B. last record of the actual data.
C. pointer to the last record of the actual data.
D. all the above.
ANSWER: A

134. In which of the following algorithm, the smallest element is found first and placed in the first position, then the next smallest in the second place, and so on?
A. Merge sort.
B. Selection sort.

C. Insertions sort.
D. Radix sort.
ANSWER: B

135. Given two sorted lists of size m and n respectively.The number of comparisons needed in the worst case by the merge sort algorithm will be _____.
A. mn.
B. max(m,n).
C. min(m,n).
D. m+n-1.
ANSWER: D

136. Very slow way of sorting is _____.
A. insertion sort.
B. heap sort.
C. bubble sort.
D. quick sort.
ANSWER: A

137. Sorting a file F usually refers to sorting F with respect to a particular key called _____.
A. basic key.
B. primary key.
C. starting key.
D. index key.
ANSWER: B

138. Selection sort first finds the _____ element in the list and put it in the first position.
A. middle element.
B. largest element.
C. last element.
D. smallest element.
ANSWER: D

139. The operation that combines the element is of A and B in a single sorted list C is called _____.
A. inserting.
B. mixing.
C. merging.
D. sharing.
ANSWER: C

140. _____ sorting is good to use when alphabetizing large list of names.
A. Merge.
B. Heap.
C. Radix.
D. Bubble.
ANSWER: C

141. Which of the following sorting algorithm is of divide-and-conquer type?
A. Bubble Sort.
B. Insertion Sort.
C. Quick Sort.
D. Merge Sort.
ANSWER: C

142. _____ is the complexity of the merge sort algorithm for both worst and average case.
A. O(n log n).
B. O(n log+n).
C. O(n+log n).
D. O(log n).
ANSWER: A

143. _____ algorithm is frequently used when the total number of elements is small.
A. Heap sort.
B. Insertion sort.
C. Bubble sort.
D. Quick sort.
ANSWER: B

144. To represent hierarchical relationship between elements, which data structure is suitable?
A. Deque
B. Tree
C. Stack
D. all the above
ANSWER: B

145. One can convert a binary tree into its mirror image by traversing it in_____.
A. inorder.
B. preorder.
C. postorder.
D. any order.
ANSWER: C

146. The best average behaviour is shown by_____
A. Quick Sort
B. Merge Sort
C. Insertion Sort
D. Heap Sort
ANSWER: A

147. If the node N is a terminal node in a binary tree then its _____.
A. right and left tree is empty.
B. left tree is empty and right tree is full.
C. right tree is empty and left tree is full.
D. right and left tree is full.
ANSWER: A

148. An algorithm is made up of two independent time complexities in the order _____.
A. f(n) x g(n).
B. Max (f(n),g(n)).
C. Min (f(n),g(n)).
D. f(n) + g(n).
ANSWER: B

149. Which of the following condition shows that stack is full?
A. TOP=NULL. .
B. TOP=MAX.
C. TOP=MAX+1.

D. POP=MAX-1
ANSWER: B

150. The elements are removed from a stack in _____ order.
A. hierarchical.
B. inorder.
C. reverse.
D. alternate.
ANSWER: C

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