Exam: End-Sem_Exam_DEC-2020_CS3CO21_Data Structures

Data Structures (T)
0/60

1. Not Answered

Suppose we are sorting an array of eight integers using heapsort, and we have just finished some heapify (either maxheapify or minheapify) operations. The array now looks like this: 16 14 15 10 12 27 28 How many heapify operations have been performed on root of heap?

A.	1
⊘ B.	2
C.	3
D.	4

2. Not Answered

Which languages necessarily need heap allocation in the run time environment?

A.	Those that support recursion
⊘ B.	Those that allow dynamic data structures
C.	Those that use global variables
D.	Those that use dynamic scoping

3. Not Answered

A data structure in which elements can be inserted or deleted at/from both the ends but not in the middle is?

A.	Queue
⊘ B.	Dequeue
C.	Circular queue
D.	Priority queue

4. Not Answered

Can you combine the following two statements into one?

char *p;

p = (char*) malloc(100);

A.	char p = *malloc(100);
B.	char *p = (char) malloc(100);
⊘ C.	char *p = (char*)malloc(100);
D.	char *p = (char *)(malloc*)(100);

5. Not Answered

Consider a binary max-heap implemented using an array. Which one of the following array represents a binary max-heap?

A.	25,12,16,13,10,8,14
B.	25,14,13,16,10,8,12
⊘ C.	25,14,16,13,10,8,12
D.	25,14,12,13,10,8,16

6. Not Answered

What kind of linked list is best to answer question like “What is the item at position n?”

A.	Singly linked list
B.	Doubly linked list
C.	Circular linked list
⊘ D.	Array implementation of linked list

7. Not Answered

A data structure in which linear sequence is maintained by pointers is known as

A.	Array
B.	Stack
⊘ C.	Linked list
D.	Pointer-based data structure

8. Not Answered

Consider an array A[20, 10], assume 4 words per memory cell and the base address of array A is 100. What is the address of A[11, 5] ? Assume row major storage.

⊘ A.	560
B.	565
C.	570
D.	575

9. Not Answered

What is the time complexity to count the number of elements in the linked list?

A.	O(1)
⊘ B.	O(n)
C.	O(logn)
D.	O(n2)

10. Not Answered

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 last node
B.	Possible if size of linked list is even
C.	Possible if size of linked list is odd
D.	Possible if X is not first node

11. Not Answered

The balance factor of a node in a binary tree is defined as

A.	addition of heights of left and right subtrees addition of heights of left and right subtrees
B.	height of right subtree minus one
⊘ C.	height of left subtree minus height of right subtree
D.	none of these

12. Not Answered

A program P reads in 500 integers in the range [0..100] exepresenting the scores 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

13. Not Answered

How do you calculate the pointer difference in a memory efficient double linked list?

A.	head x or tail
⊘ B.	a) pointer to previous node xor pointer to next node
C.	pointer to previous node – pointer to next node
D.	pointer to next node – pointer to previous node

14. Not Answered

If the elements “A”, “B”, “C” and “D” are placed in a queue and are deleted one at a time, in what order will they be removed?

A.	ABDC
B.	DCBA
C.	DCAB
⊘ D.	ABCD

15. Not Answered

Which of the following is not a disadvantage to the usage of array?

A.	Fixed size

B.	There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size
C.	Insertion based on position
⊘ D.	Accessing elements at specified positions

16. Not Answered

What is the worst case complexity of binary search using recursion?

A.	O(nlogn)
⊘ B.	O(logn)
C.	O(n)
D.	O(1)

17. Not Answered

The number of leaf nodes in a rooted tree of n nodes, with each node having 0 or 3 children is:

A.	n/2
B.	(n-1)/3
C.	(n-1)/2
⊘ D.	(2n+1)/3

18. Not Answered

Which of the following stable sorting algorithm takes the least time when applied to an almost sorted array?

A.	Insertion Sort
⊘ B.	Merge Sort

C.	Quick Sort
D.	Bubble Sort

19. Not Answered

If several elements are competing for the same bucket in the hash table, what is it called?

A.	Diffusion
B.	Replication
⊘ C.	Collision
D.	Duplication

20. Not Answered

What is (void*)0?

⊘ A.	Representation of NULL pointer
B.	Representation of void pointer
C.	Error
D.	None of above

21. Not Answered

What is the best case for linear search?

A.	O(nlogn)
B.	O(nlog2n)
C.	O(n)
⊘ D.	O(1)

22. Not Answered

Which of the following data structure is useful in traversing a given graph by breadth first search?

A.	Stack
B.	Linked List
⊘ C.	Queue
D.	List

23. Not Answered

Which of the following points is/are not true about Linked List data structure when it is compared with array?

A.	Arrays have better cache locality that can make them better in terms of performance
B.	It is easy to insert and delete elements in Linked List
C.	Random access is not allowed in a typical implementation of Linked Lists
⊘ D.	Access of elements in linked list takes less time than compared to arrays

24. Not Answered

Which of the following is not a stable sorting algorithm in its typical implementation.

A.	Insertion Sort
B.	Merge Sort
⊘ C.	Quick Sort
D.	Bubble Sort

25. Not Answered

Consider a situation where swap operation is very costly. Which of the following sorting algorithms should be preferred so that the number of swap operations are minimized in general?

A.	Insertion Sort
B.	Merge Sort
⊘ C.	Selection Sort
D.	Bubble Sort

26. Not Answered

Where is linear searching used?

A.	When the list has only a few elements
B.	When performing a single search in an unordered list
C.	Used all the time
⊘ D.	When the list has only a few elements and When performing a single search in an unordered list

27. Not Answered

Minimum time required to solve tower of hanoi puzzle with 4 disks assuming one move takes 2 seconds, will be _____

A.	15 seconds
B.	16 seconds
⊘ C.	30 seconds
D.	32 seconds

28. Not Answered

How many cases are there, which are used to compare various data structure's execution time in a relative manner?

A.	2

⊘ B.	3
C.	4
D.	5

29. Not Answered

```
int func(int a, int b)
{
if(b==0)
return 0;
if(b==1)
return a;
return a + func(a,b-1);
}
```

what will be the output of func(3,8)

A.	11
⊘ B.	24
C.	22
D.	21

30. Not Answered

Consider a small circular linked list. How to detect the presence of cycles in this list effectively?

A.	Keep one node as head and traverse another temp node till the end to check if its ‘next points to head
⊘ B.	Have fast and slow pointers with the fast pointer advancing two nodes at a time and slow pointer advancing by one node at a time

C.	Cannot determine, you have to pre-define if the list contains cycles
D.	linked list itself represents a cycle. So no new cycles cannot be generated

31. Not Answered

Which of the following is NOT a rule of tower of hanoi puzzle?

A.	No disk should be placed over a smaller disk
B.	Disk can only be moved if it is the uppermost disk of the stack
⊘ C.	No disk should be placed over a larger disk
D.	Only one disk can be moved at a time

32. Not Answered

Which of the following is false about a doubly linked list?

A.	We can navigate in both the directions
B.	It requires more space than a singly linked list
C.	The insertion and deletion of a node take a bit longer
⊘ D.	Implementing a doubly linked list is easier than singly linked list

33. Not Answered

Which case of data structure operation takes maximum time?

⊘ A.	Worst Case
B.	Average Case

C.	Best Case
D.	None of the above

34. Not Answered

How many stacks are needed to implement a queue. Consider the situation where no other data structure like arrays, linked list is available to you.

A.	1
B.	3
⊘ C.	2
D.	4

35. Not Answered

In simple uniform hashing, what is the search complexity?

A.	O(nlogn)
B.	O(logn)
C.	O(n)
⊘ D.	O(1)

36. Not Answered

The maximum number of binary trees that can be formed with three unlabeled nodes is:

A.	1
⊘ B.	5
C.	6
D.	7

37. Not Answered

using recursion time complexity of the algorithm is ….

⊘ A.	increased
B.	decreased
C.	not affected
D.	none of these

38. Not Answered

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 first element
B.	Insert a new element as a first element
⊘ C.	Delete the last element of the list
D.	Add a new element at the end of the list

39. Not Answered

Let G be a simple graph with 20 vertices and 8 components. If we delete a vertex in G, then number of components in G should lie between ____.

A.	8 and 20
B.	8 and 19
⊘ C.	7 and 19
D.	7 and 20

40. Not Answered

In case of insertion into a linked queue, a node borrowed from the _____ list is inserted in the queue.

A.	REAR
⊘ B.	AVAIL
C.	FRONT
D.	None of the mentioned

41. Not Answered

The Tower of Hanoi has many useful applications. It is used in which of the following field(s)?

A.	Psychological research
B.	Data backup rotation scheme
C.	Computer programming and algorithms
⊘ D.	All of these

42. Not Answered

Which of the following data structures can be efficiently implemented using AVL tree?

A.	linked list
⊘ B.	priority queue
C.	heap
D.	all of the above

43. Not Answered

Which of the following is identical to that of a separate chaining hash node?

⊘ A.	Linked list
B.	Array
C.	Stack
D.	Queue

44. Not Answered

A binary search tree is formed from the sequence 6, 9, 1, 2, 7, 14, 12, 3, 8, 18. The minimum number of nodes required to be added in to this tree to form an extended binary tree is?

A.	3
B.	6
C.	8
⊘ D.	11

45. Not Answered

What is the worst case for linear search?

A.	O(nlogn)
B.	O(nlog2n)
⊘ C.	O(n)
D.	O(1)

46. Not Answered

What is the space complexity for deleting a linked list?

⊘ A.	O(1)
B.	O(n)
C.	Either O(1) or O(n)
D.	O(logn)

47. Not Answered

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.	Both of the above
⊘ C.	None of the above
D.	In push operation, if new nodes are inserted at the beginning of linked list, then in pop operation, nodes must be removed from end.

48. Not Answered

Which of the following operations are done in a hash table?

A.	Insert only
B.	Search only
⊘ C.	Insert and search
D.	Replace

49. Not Answered

What is the worst case time complexityof quick sort?

A.	O(nlogn)
B.	O(nlog2n)

C.	O(n)
⊘ D.	O(n*n)

50. Not Answered

Which one of the following is an application of Queue Data Structure?

A.	Load Balancing
B.	When a resource is shared among multiple consumers.
C.	When data is transferred asynchronously (data not necessarily received at same rate as sent) between two processes
⊘ D.	All of the above

51. Not Answered

If a variable is a pointer to a structure, then which of the following operator is used to access data members of the structure through the pointer variable?

A.	.
B.	&
C.	*
⊘ D.	->

52. Not Answered

Which of the following data structure is linear type?

A.	Graph
B.	Trees
C.	Binary tree
⊘ D.	Stack

53. Not Answered

In adjacency list representation, space is …..for sparse graphs

A.	Wasted
⊘ B.	Saved
C.	Overutilized
D.	Underutilized

54. Not Answered

Recursive solution of tower of hanoi problem is an example of which of the following algorithm?

⊘ A.	Divide and conquer
B.	Dynamic programming
C.	Backtracking
D.	Greedy algorithm

55. Not Answered

Which of the following concepts make extensive use of arrays?

A.	Binary trees
B.	Scheduling of processes
C.	Caching
⊘ D.	Spatial locality

56. Not Answered

Which type of traversal of binary search tree outputs the value in sorted order?

A.	Pre-order
⊘ B.	In-order
C.	In-order

D.	In-order

57. Not Answered

Each Node contain minimum two fields one field called data field to store data. Another field is of type _____.

A.	Pointer to Character
B.	Pointer to Class
C.	Pointer to an Integer
⊘ D.	Pointer to Node

58. Not Answered

Postfix form of following expression.D + (E * F)

⊘ A.	DEF * +
B.	DEF +*
C.	EF * D+
D.	EFD *+

59. Not Answered

Linked list is considered as an example of……..type of memory allocation.

⊘ A.	Dynamic
B.	Static
C.	Compile time

D.	Heap

60. Not Answered

Stack data structure cannot be used for

A.	Implementation of Recursive Function
B.	Evaluation of string in postfix form
C.	Reversing string
⊘ D.	Allocation Resources and Scheduling