Comprehensive-DS-Question-Bank

Qno	Question	Answer
1	The total no. of children of a node in a tree is known as a) Height b) Scale c) Degree d) Depth	C
2	Which data structure is required to convert the infix to prefix notation? A) Stack B) linked list C) binary tree D) queue	A
3	How can we initialize an array in C language? A)int arr[2]=(10,20) B)int arr(2)=(10,20) C)int arr[2]={10,20} D)int arr(2)={10,20}	C
4	Which of the following is non-linear data structure? [A] Trees [B] Stacks [C] Strings [D] All of the above	A
5	One can convert a binary tree to its mirror image by traversing it in A) Inorder B) Preorder C) Postorder D) None of the above	C
6	Visiting root node after visiting left and right sub-trees is called A - In-order Traversal B - Pre-order Traversal C - Post-order Traveral	C
7	Which of the following is the prefix form of `A+B*C` ? A. `A+(BC*)` B. `+AB*C`	D

Qno	Question	Answer
	C. `ABC+*` D. `+A*BC`	
8	Consider the following loop for i = 1 to n for j = 1 to i print “HELLO” The asymptotic time complexity of above loop is a) O(n^2) b) O(nlogn) c) O(n^3) d) O(n)	A
9	Quick sort algorithm is an example of a) greedy approach. b) improved binary search. C) dynamic programming d)divide and conquer	D
10	Merge sort uses which of the following technique to implement sorting? a) backtracking b) greedy algorithm c) divide and conquer d) dynamic programming	C

11	Consider the following C code. Assume that unsigned long int type
	length is 64 bits.
	
	unsigned long int fun(unsigned long int n)
	{ unsigned long int i, j = 0, sum = 0;
	for (i = n; i > 1; i = i/2)
	j++;
	for (; j > 1; j = j/2)
	sum++;
	return(sum); }
	
	The value returned when we call fun with the input 2 40 is (A) 4 (B) 5
	(C) 6 (D) 40
		B

12	Which of the following has a search efficiency of O(1): A)Tree B) Heap	C

Qno	Question	Answer
	C) Hash Table D) Linked List	
13	Using division method, in a given hash table of size 157, the key of value 172 be placed at position a) 19 b) 72 c) 15 d) 17	C
14	What is the time complexity of a Merge Sort Algorithm? a) O(n logn) b) On3 c) On d) On2	A
15	Which one of the below is not divide and conquer approach? A - Insertion Sort B - Merge Sort C - Shell Sort D - Heap Sort	B
16	___ is a pile in which items are added at one end and removed from the other. A) List B) Queue C) Stack D) Array	B
17	A linear collection of data elements where the linear node is given by means of pointer is called? a) Linked list b) Node list c) Primitive list d) Unordered list	A
18	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	D

Qno	Question	Answer
	c) Insertion based on position d) Accessing elements at specified positions	

19	The postfix expression for the infix expression `A+B*(C+D)/F+D*E` is:
	
	`a) AB+CD+*F/D+E*`
	`b) ABCD+*F/DE*++`
	`c) A*B+CD/F*DE++`
	`d) A+*BCD/F*DE++`
		B

20	If the size of the stack is 10 and we try to add the 11th element in the stack then the condition is known as `___` A)Underflow B)Garbage collection C)Overflow D)None of the above	C
21	Out of the following tree structure which is efficient considering space and time complexities. a)Incomplete binary tree b)Complete binary tree c)Full binary tree	B
22	Minimum number of fields in each node of a doubly linked list is `____` (A) 2 (B) 3 (C) 4 (D) None of the above	B

23	If the array is already sorted, which of these algorithms will exhibit the best performance
	
	`A - Merge Sort`
	`B - Insertion Sort`
	`C - Quick Sort`
	`D - Heap Sort`
		B

24	How can we describe an array in the best possible way?	Container that stores the elements of similar types
25	What is the value of postfix expression `6324+-*` A)Something between - 5 and 15	D

Qno	Question	Answer
	B)Something between 5 and - 5 C)Something between 5 and 15 D)Something between 15 and 100	

26	What is the output of the below code?
	# include <stdio.h>
	int main()
	{
	int arr[5]={10,20,30,40,50};
	printf("%d", arr[5]);
	return 0;
	}
	
	a. Garbage value
	b. 10
	c. 50
	d. None of the above
		A

27	Which of the following is not the operation that can be performed on queue a) Insertion b) Deletion c) Retrieval d) Traversal	D
28	One can convert a binary tree to its mirror image by traversing it in A) Inorder B) Preorder C) Postorder D) None of the above	C
29	Which is the type of data structure where each node can have at most two children ? a) Binary Tree b) Graph c) Linked List d) Array	A
30	Which of the following is not true about comparison based sorting algorithms? A)The minimum possible time complexity of a comparison	D

Qno	Question	Answer
	based sorting algorithm is O(nLogn) for a random input array B)Any comparison based sorting algorithm can be made stable by using position as a criteria when two elements are compared C)Counting Sort is not a comparison based sorting algortihm D)Heap Sort is not a comparison based sorting algorithm	
31	Which of the following are not a tree terminology a)root b)edge c)parent d)stem	D
32	Which data structure is mainly used for implementing the recursive algorithm? A) Queue B) stack C) binary tree D) Linked list	B
33	Which of the following highly uses the concept of an array? A.Binary Search tree B.Caching C.Spatial locality D.Scheduling of Processes	C
34	The time complexity of enqueue operation in Queue is __ a)O(1) b) O(n) c) O(logn) d) O(nlogn)	A
35	Which one of the below mentioned is linear data structure A - Queue B - Stack C - Arrays D - All of the above	D
36	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

Qno	Question	Answer
	d) Implementing a doubly linked list is easier than singly linked list	
37	Time required to concatenate two doubly linked list is	o(n) as we cannot find the last element in the time o(1)
38	Which of the following is the correct way of declaring an array? int javatpoint[10]; int javatpoint; javatpoint{20}; array javatpoint[10];	A
39	What is time complexity of heap sort algorithm? A) O(1) B) O(n) C) O(log n) D) O(nLogn)	D
40	Consider the basic block given below. a=b+c c=a+d d=b+c e= d - b a=e+b The minimum number of nodes and edges present in the DAG representation of the above basic block respectively are (A) 6 and 6 (B) 8 and 10 (C) 9 and 12 (D) 4 and 4	A
41	The postfix form of the expression `(A+ B)*(C*D- E)*F / G` is? A) `AB+ CD*E – FG /**` B) `AB + CD* E – F **G /` C) `AB + CD* E – *F *G /` D) `AB + CDE * – * F *G /`	C
42	Which of the following algorithm is not stable? A) Bubble sort B) Quick sort C) Merge sort D) Insertion sort	B
43	Which method can find if two vertices x & y have path between them? A - Depth First Search	C

Qno	Question	Answer
	B - Breadth First Search C - Both A & B D - None A or B	
44	What is worst case time complexity of linear search algorithm? B) O(1) B) O(n) C) O(log n) D) O(n^2)	B
45	Which of the following is an example for a postfix expression? a) `a*b(c+d)` b) `abc*+de-+` c) `+ab` d) `a+b-c`	B
46	Which of the following that determines the need for the Circular Queue? a. Avoid wastage of memory b. Access the Queue using priority c. Follows the FIFO principle d. None of the above	A
47	You have an array of n elements. Suppose you implement a quick sort by always choosing the central element of the array as the pivot. Then the tightest upper bound for the worst case performance is (A) 0(n^2) (B) 0(n log n) (C) θ(n log n) (D) θ(n^2)	A
48	B+ trees are preferred to binary tree in Database because 1.Disk capacity are greater than memory capacities 2.Disk access is much slower than memory access 3.Disk data transfer rates are much less than memory data transfer rate 4.Disks are more reliable than Memory	2.Disk access is much slower than memory access
49	Minimum number of queues required for priority queue implementation? A-5 B-4 C-3 D-2	D
51	In a min heap : (A) Parent nodes have values greater than or equal to their	B

Qno	Question	Answer
	child (B) Parent nodes have values less than or equal to their child (C) both statements are true (D) both statements are false	
52	Q 1 - In order traversal of binary search tree will produce − A - unsorted list B - reverse of input C - sorted list D - none of the above	C
53	What is the worst case run-time complexity of binary search algorithm? A - O(n2) B - O(nlog n) C - O(n3) D - O(n	D
54	Which of the following uses memoization? A - Greedy approach B - Divide and conquer approach C - Dynamic programming approach D - None of the above!	C
55	What is the time complexity of pop() operation when the stack is implemented using an array? a) O(1) b) O(n) c) O(logn) d) O(nlogn)	A
56	The Inorder and Preorder traversal of a binary tree is d b e a f c g and a b d e c f g respectively. Which among the following is the correct Post Order Traversal Sequence for this tree?	d e b f g c a
57	Which of the following is not the application of stack?	Data Transfer between two asynchronous processes
58	In the worst case, the number of comparisons needed to search a singly linked list of length n for a given element is?	n
59	To implement a stack using queue (with only enqueue and dequeue operations), how many queues will you need?	2

Qno	Question	Answer
60	The optimal data structure used to solve Tower of Hanoi is `_____`	Stack
61	Assume that the operators +, -, X are left associative and ^ is right associative. The order of precedence (from highest to lowest) is ^, X, +, -. The postfix expression for the infix expression `a + b X c – d ^ e ^ f` is?	`abc X+ def ^^ –`
62	The time complexity of heap sort in worst case is	O(nlogn)
63	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?	2
64	What is the number of edges present in a complete graph having n vertices?	`(n*(n-1))/2`
65	If several elements are competing for the same bucket in the hash table, what is it called?	Collision
66	Which data structure is used to store the undo history in a web browser?	Stack
67	When a pop operation is called on an empty queue, what is the condition called?	Underflow
68	Given a binary tree with the following elements 50,25,75,10,30,60,90. Which traversal technique will produce the following sequence? 10,30,25,60,90,75,50	Post order
69	Which sorting algorithm has a time complexity of O(n log n) in the average and worst case?	Quick sort
70	Which of the following statements about a linked list is true? a) It has a fixed size b) Elements stored contiguously in memory c) It allows for efficient random access d) It consists of nodes linked by pointers	It consists of nodes linked by pointers
71	Which type of linked list has its last node pointing to the first node?	Circular linked list
72	Travelling salesman problem is an example of	Greedy algorithm

Qno	Question	Answer
73	Time complexity of Depth First traversal is	O(V + E)
74	Visiting root node after visiting left and right subtrees is called	Post order traversal
75	How is the second element in an array accessed based on pointer notation	`*a + 2`
76	The worst case complexity of quick sort is a) O(n) b) O(log n) c) O(n^2) d) O(n log n)	C

77	What is the output of following function for start pointing to the first node of following linked list?
	
	1->2->3->4->5->6
	
	void fun(struct node * start)
	{
	if(start == NULL)
	return;
	printf("%d",start->data)
	if(start->next!=NULL)
	fun(start->next->next);
	printf("%d",start->data);
	}
		135531

78	The prefix form of `A-B(C*D ^ E)` is	`-A/BC*^DE`
79	Suppose we are sorting an array of eight integers using quicksort, and we have just finished the first partitioning with the array looking like this. 2 5 1 7 9 12 11 10 Which statement is correct? a) The pivot could be either the 7 and 9 b) The pivot could be 8 but it is not 9 c) THe pivot is not 7 but it could be 9 d) Neither the 8 or 9 is the pivot	a) The pivot could be either the 7 and 9
80	In a complete k-ary tree, every internal node has exactly k children or no child. The number of leaves in such a tree with n internal nodes is	L=n·(k−1)+1
81	If a node in a binary search tree has 2 children, then its inorder predecessor has	No right child

Qno	Question	Answer
82	Using Bubble sort the number of interchanges required to sort 5,1,6,2 and 4 in ascending order is....	5
83	Which of the following is a sequence container a) Stack b) Dequeue c) Queue d) set	B
84	Minimum number of queues needed to implement the priority queue is	1
85	The data structure used in breadth first search algorithm is	Queue