



Mahavir Education Trust's
SHAH & ANCHOR KUTCHHI ENGINEERING COLLEGE
Chembur, Mumbai - 400 088
UG Program in Information Technology

Sample paper for DSA -DSE 2020-21

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	To represent hierarchical relationship between elements, which data structure is suitable?
Option A:	Queue
Option B:	Priority
Option C:	Tree
Option D:	List
2.	One can convert a binary tree to its mirror image by traversing it in
Option A:	Inorder
Option B:	Postorder
Option C:	Straight
Option D:	Preorder
3.	An algorithm that calls itself directly or indirectly is known as
Option A:	Sub algorithm
Option B:	Recursion
Option C:	Polish notation
Option D:	Traversal algorithm
4.	The post order traversal of a binary tree is DEBFCA. Find out the preorder traversal
Option A:	ABFCDE
Option B:	ADBFEC
Option C:	ABDECF
Option D:	ABDCEF
5.	The inorder traversal of tree will yield a sorted listing of elements of tree in
Option A:	Binary trees
Option B:	Binary search trees
Option C:	Heaps
Option D:	queue
6.	What is a memory efficient double linked list?
Option A:	Each node has only one pointer to traverse the list back and forth
Option B:	The list has breakpoints for faster traversal
Option C:	An auxiliary singly linked list acts as a helper list to traverse through the doubly linked list
Option D:	A doubly linked list that uses bitwise AND operator for storing addresses



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7.	Which of the following application makes use of a circular linked list?
Option A:	Undo operation in a text editor
Option B:	Recursive function calls
Option C:	Allocating CPU to resource
Option D:	Implement Hash Tables
8.	Underflow condition in a linked list may occur when attempting to
Option A:	Insert a new node when there is no free space for it
Option B:	Delete a non-existent node in the list
Option C:	Delete a node in empty list
Option D:	Delete existent node
9.	A binary tree T has n leaf nodes. The number of nodes of degree 2 in T is
Option A:	$\log_2 n$
Option B:	$n-1$
Option C:	n
Option D:	$2n$
10.	A binary tree has a height of 5. What is the minimum number of nodes it can have?
Option A:	31
Option B:	15
Option C:	5
Option D:	1
11.	Which of the following statements for a simple graph is correct?
Option A:	Every path is a trail
Option B:	Every trail is a path
Option C:	Every trail is a path as well as every path is a trail
Option D:	Path and trail have no relation
12.	A hash table has space for 100 records. What is the probability of collision before the table is 10% full?
Option A:	0.45
Option B:	0.5
Option C:	0.3



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Option D:	0.34
13.	In any hash function, M should be a
Option A:	Prime number
Option B:	Composite number
Option C:	Even number
Option D:	Odd number
14.	In which of the following hash functions, do consecutive keys map to consecutive hash values?
Option A:	Division method
Option B:	Multiplication method
Option C:	Folding method
Option D:	Mid-square method
15.	Which open addressing technique is free from clustering problems?
Option A:	Linear probing
Option B:	Quadratic probing
Option C:	Double hashing
Option D:	Rehashing
16.	Breadth first search
Option A:	scans all incident edges before moving to other vertex
Option B:	scans adjacent unvisited vertex as soon as possible
Option C:	Is same as backtracking
Option D:	computes a path between two vertices of graph or equivalently
17.	which method of traversal does not use stack to hold nodes that are waiting to be processed?
Option A:	Depth first
Option B:	D-search
Option C:	Breadth first
Option D:	Back-tracking
18.	Which of the following is not a technique to avoid a collision?
Option A:	Separate Chaining
Option B:	Increasing hash table size
Option C:	Open addressing



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Option D:	Linear probing
19.	Which of the following method is not used to find the minimum spanning tree
Option A:	Prims
Option B:	Kruskals
Option C:	Huffman
Option D:	Prims & Kruskals
20.	which is the major data structure used in Network Data model?
Option A:	stack
Option B:	trees
Option C:	graph
Option D:	queue

Q2	Solve any Two Questions out of Three	10 marks each
A	Explain Binary search tree. Construct binary search tree for following elements 45,39,56,12,34,78,32,10,89,54,67,81	
B	Explain BFS and DFS algorithm with examples.	
C	Explain Heap sort using an example. Write algorithm for it and comment on its complexity	

Q3.	Solve any Two Questions out of Three	10 marks each
A	What is singly linked list? Write an algorithm to implement following operations on singly linked list 1. Insertion (All cases) 2. Deletion (All Cases) 3. Traversal	
B	What is collision? What are the methods to resolve collision? Explain linear probing with an example.	
C	What is minimum spanning tree? Explain Kruskal's Algorithm with an example.	