**Data Structures Objective Bits**

**Common to AI&DS and IT**

**UNIT-III: Queue**

1. ......... form of access is used to add and remove nodes from a queue.  
   a) LIFO, Last In First Out b) FIFO, First In First Out  
   c) Both a and b d) None of these
2. A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Queue follows \_\_\_\_\_\_\_\_\_\_\_ principle [ ]

a) FIFO b) LIFO c) Both A &B d) None of the above

1. Insertion and Deletion operation in Queue is known as ? [ ]

a) Push and Pop b) Enqueue and Dequeue c) Insert and Delete d) None

1. 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) ABCD b) DCBA c) DCAB d) None

1. In linked list implementation of a queue, where does a new element be inserted? [ ]

a) At the head of linked list b) At the tail of the linked list

c) At the centre position in the linked list d) None of the above

1. A normal queue, if implemented using an array of size MAX\_SIZE, gets full when[ ]

a) rear = MAX\_SIZE b) front = (rear+1)mod MAX\_SIZE

c) front = rear+1 d) rear = front

1. In a linked List representation of queue, only maximum of\_\_\_\_\_\_ elements can be added. a) One b) Two c) Three d) No limit [ ]
2. Consider a linear queue of size 5, Assume the following operations are done on the queue: Enqueue(10), Enqueue(20), Enqueue(30), Enqueue(40), Enqueue(50), Enqueue(60).

The elements of the queue are. [ ]

(A) 10, 20, 30, 40, 50 (B) 10, 20, 30, 40, 50, 60

(C) 10, 20, 30, 40, 60 (D) 60, 50, 40, 30, 20, 10

1. A circular queue is implemented using an array of size 10. The array index starts with 0, front is 6, and rear is 9. The insertion of next element takes place at the array index. [ ]

(A) 0 (B) 7 (C) 9 (D) 10

1. \_\_\_\_\_\_\_\_\_\_ is used to overcome the problem of linear queue. [ ]

(A) Linked List (B) Circular Queue (C) Both A & B (D) None

1. 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) Circular queue c) Dequeue d) Priority queue
2. Let the following circular queue can accommodate maximum 5 elements with the following data front = 2 rear = 4 (assume queue ranges from 0 to 4)

queue = \_\_\_,\_\_\_, L, M, N,

What will happen after Enqueue(O), Dequeue()operation takes place? [ ]

(A) front = 2 rear = 5 (B) front = 3 rear = 5

(C) front = 2 rear = 0 (D) front = 3 rear = 0

1. Consider a linear queue of size 5, Assume the following operations are done on the queue: Enqueue(100), Enqueue(200), Enqueue(300), Enqueue(400), Enqueue(500), Dequeue(), Dequeue( ), Dequeue( ), Enqueue(600). The elements of the queue are: [ ]

(A) 100, 200, 300, 400, 50 (B) 100, 200, 300, 400, 500, 600

(C) 400, 500 (D) 400, 500, 60

1. The initial configuration of a queue is a, b, c, d (a is at the **front** end). To get the configuration d, c, b, a one needs a minimum of \_\_\_\_\_\_\_\_\_\_\_ [ ]

(A) 2 deletions and 3 insertions (B) 4 deletions and 3 insertions

(C) 3 deletions and 3 insertions (D) 3 deletions and 4 insertions

**UNIT-IV: Trees**

1. How many nodes in a tree have ***no*** ancestors? [ ]

(A) 0 (B) 1 (C) 2 (D) n

1. What is the maximum possible number of nodes in a binary tree at level ***6***? [ ]

(A) 6 (B) 12 (C) 64 (D) 32

1. 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

1. In order to get the information stored in a Binary Search Tree in the descending order, one should traverse it in which of the following order? [ ]

(A) left, root, right (B) root, left, right

(C) right, root, left (D) right, left, root

1. One can convert a binary tree into its mirror image by traversing it in \_\_\_\_. [ ]

(A) Inorder (B) Preorder (C) Postorder (D) Any order

1. What is common in three different types of traversals (Inorder, Preorder and Postorder)?

(A) Root is visited before right subtree

(B) Left subtree is always visited before right subtree

(C) Root is visited after left subtree

(D) All of the above

1. Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 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) 7 5 1 0 3 2 4 6 8 9 (B) 0 2 4 3 1 6 5 9 8 7

(C) 0 1 2 3 4 5 6 7 8 9 (D) 9 8 6 4 2 3 0 1 5 7

1. Postorder 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) 9, 10, 15, 22, 23, 25, 27, 29, 40, 50, 60, 95

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

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

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

1. In a max-heap, element with the greatest key is always in the which node? [ ]  
   a) Leaf node b) First node of left sub tree  
   c) root node d) First node of right sub tree
2. Heap can be used as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [ ]  
   a) Priority queue b) Stack c) A decreasing order array d) Normal Array
3. What is an AVL tree? [ ]  
   a) a tree which is balanced and is a height balanced tree  
   b) a tree which is unbalanced and is a height balanced tree  
   c) a tree with three children  
   d) a tree with atmost 3 children
4. Why we need to a binary tree which is height balanced? [ ]  
   a) to avoid formation of skew trees  
   b) to save memory  
   c) to attain faster memory access  
   d) to simplify storing
5. How many children does a binary tree have? [ ]  
   a) 2 b) any number of children c) 0 or 1 or 2 d) 0 or 1
6. What is the parent for a node with index ‘i’ of a complete binary tree in an array representation when i is not 1 (Assume index starts from 1)? [ ]  
   a) floor(i/2) b) ceil(i/2) c) i-1/2 d) i/2
7. What is the left child index for a node with indexing ‘i’ of a complete binary tree in an array representation? (Assume index starts from 1)? [ ]  
   a) 2\*i b) 2+i c) 2/i d) (2\*i)+1
8. What is the right child index for a node with indexing ‘i’ of a complete binary tree in an array representation? (Assume index starts from 1)? [ ]  
   a) 2\*i b) 2+i c) 2/i d) (2\*i)+1
9. Which of the following is false about a binary search tree? [ ]  
   a) The left child is always lesser than its parent  
   b) The right child is always greater than its parent  
   c) The left and right sub-trees should also be binary search trees  
   d) In order sequence gives decreasing order of elements
10. What is the speciality about the inorder traversal of a binary search tree? [ ]  
    a) It traverses in a non increasing order  
    b) It traverses in an increasing order  
    c) It traverses in a random fashion  
    d) It traverses based on priority of the node
11. What does the following piece of code do? [ ]

public void func(Tree root)

{

func(root.left());

func(root.right());

System.out.println(root.data());

}

a) Preorder traversal b) Inorder traversal  
c) Postorder traversal d) Level order traversal

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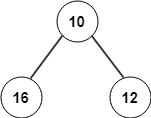
func(root.left());

System.out.println(root.data());

func(root.right());

}

a) Preorder traversal b) Inorder traversal  
c) Postorder traversal d) Level order traversal

1. What is the maximum number of children that a binary tree node can have? [ ]  
   a) 0 b) 1 c) 2 d) 3
2. The following given tree is an example for? [ ]  
   [](https://www.sanfoundry.com/wp-content/uploads/2018/07/binary-tree-operations-questions-answers-q2.png)  
   a) Binary tree b) Binary search tree c) Fibonacci tree d) AVL tree
3. Which of the following is the name of the node having child nodes? [ ]  
   a) Brother b) Sister c) Mother d) Parent
4. The balance factor of a node in a binary tree is defined as \_\_\_\_\_ [ ]  
   a) addition of heights of left and right subtrees  
   b) height of right subtree minus height of left subtree  
   c) height of left subtree minus height of right subtree  
   d) height of right subtree minus one
5. A binary tree is balanced if the difference between left and right subtree of every node is not more than \_\_\_\_ [ ]  
   a) 1 b) 3 c) 2 d) 0
6. Advantages of linked list representation of binary trees over arrays? [ ]  
   a) dynamic size  
   b) ease of insertion/deletion  
   c) ease in randomly accessing a node  
   d) both dynamic size and ease in insertion/deletion
7. Disadvantages of linked list representation of binary trees over arrays? [ ]  
   a) Randomly accessing is not possible  
   b) Extra memory for a pointer is needed with every element in the list  
   c) Difficulty in deletion  
   d) Random access is not possible and extra memory with every element
8. Which of the following traversing algorithm is not used to traverse in a tree? [ ]  
   a) Post order b) Pre order c) In order d) Randomized
9. What is the location of a parent node for any arbitary node i? [ ]  
   a) (i/2) position  
   b) (i+1)/ position  
   c) floor(i/2) position  
   d) ceil(i/2) position

. **UNIT-V: Graphs and Hashing**

1. A graph with all vertices having equal degree is known as a \_\_\_\_\_\_\_\_\_\_ **[ ]**  
   a) Multi Graph b) Regular Graph c) Simple Graph d) Complete Graph
2. A graph having an edge from each vertex to every other vertex is called a \_\_\_\_\_\_\_\_**[ ]**  
   a) Tightly Connected b) Strongly Connected   
   c) Weakly Connected d) Loosely Connected
3. The number of elements in the adjacency matrix of a graph having 7 vertices is \_\_\_\_\_\_**[ ]**  
   a) 7 b) 14 c) 36 d) 49
4. The size of the adjacency matrix required to represent a graph having N vertices is \_\_\_\_\_\_\_\_\_\_ **[ ]**  
   a) N\*N b) N\*N+1 c) 0\*N d) N\*1
5. The size of the adjacency matrix required to represent a graph having 7 vertices is \_\_\_\_\_\_\_\_\_\_ **[ ]**  
   a) 7\*7 b) 7\*8 c) 1\*7 d) 7\*1
6. The maximum degree of any vertex in a simple graph with n vertices is\_\_\_[ ]

(A) n–1 (B) n+1 (C) 2n–1 (D) n

1. 4An adjacency matrix representation of a graph cannot contain information of \_\_\_\_\_\_

(A) Nodes (B) edges [ ]

(C) Direction of edges (D) parallel edges

1. The data structure required for Breadth First Traversal on a graph is \_\_\_\_\_\_\_\_\_**[ ]**

(A) Queue (B) Stack (C) Array (D) Tree

1. The data structure required for Depth First Traversal on a graph is \_\_\_\_\_\_\_\_\_ **[ ]**

(A) Queue (B) Stack (C) Array (D) Tree

1. . In a graph if e=(u,v) means ....... [ ]

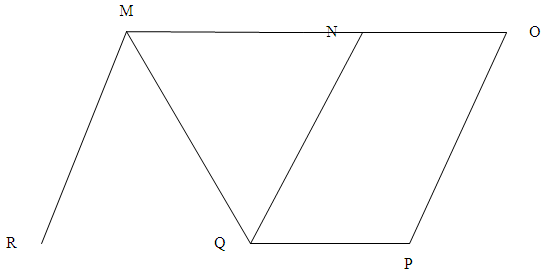
A) u is adjacent to v but v is not adjacent to u.

B) e begins at u and ends at v

C) u is node and v is an edge.

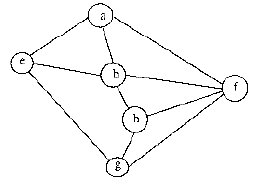
D) both u and v are edges.

1. The BFS Algorithm has been implemented using Queue Data Structure. One possible order of visiting nodes in the following graph is [ ]



(A) MNOPQR (B) NQMPOR (C) QMNPRO (D) QMNPOR

1. Consider the following graph **[ ]**



Among the following sequences which are depth first traversals of the above graph?

i) a b e g h f  ii) a b f e h g iii) a b f h g e  iv) a f g h b e

1. In a hash table of length 11, the key value 80 can be placed using division hash function at index **[ ]**

A) 3 B)4 C)5 D) 6

1. In a hash table of size 13, the elements to be inserted are 18, 31, and 44 using Division hash function. With Quadratic probing 44 can be placed in cell.

A)6 B)7 C)8 D)9

1. is a collision resolution technique that uses linked lists to handle collisions [ ]

A)Linear probing B)Quadratic probing C)Double hashing D)Open Hashing

1. The situation in which the hash function returns the same index for more than one key is called as \_\_\_\_\_\_\_\_\_ [ ]

a)collision b)hashing c)both d)none

1. In a hash table of length 11, the key value 88 can be placed using division hash function at index **[ ]**

A) 3 B)4 C)0 D) 6

1. In a hash table of length 11, the key value 48 can be placed using division hash function at index **[ ]**

A) 3 B)4 C)5 D) 6

1. In open hashing collision resolution technique which data structure is used? [ ]

a)linked list b)stack c)queue d) none

1. Stack Data structure is used to write which of the traversals of graph. [ ]

a)DFS b)BFS c) Both d)None

1. Queue Data structure is used to write which of the traversals of graph. [ ]

a)DFS b)BFS c) Both d)None

1. E ach position of the hash table is often called as a\_\_\_\_\_\_\_\_[ ]

a) Bucket b) Cabin c)both d)none

1. \_\_\_\_\_\_\_\_\_\_\_\_is used to map the search key to an index.[ ]

a) Hash function b)critical function c)both d)none

1. A graph can be represented in the following ways\_\_\_\_\_\_[ ]

a)Set Representation b) Adjacency List Representation

c)Adjacency Matrix Representation d)all the above

1. What is load factor of hash table\_\_\_\_\_\_\_[ ]

a) (no. of elements) / (no. of table slots) b) (no. of elements) / (no. of table slots)

c)both d)none

1. Given a hash table T with 25 slots that stores 2000 elements, the load factor α for T is \_\_\_\_\_\_\_\_\_\_  
   a)80 b)0.0125 c)8000 d)1.25
2. Closed hashing collision resolution techniques are\_\_\_\_[ ]

a) Linear Probing b)Quadratic Probing c)Double Hashing d)All

1. Which of the following is Quadratic probing function\_\_\_\_\_\_\_\_\_\_\_\_[ ]

a) h1 (k,i) = (h(k)+ i 2 ) mod m b) h1 (k,i) = (h(k)+ i) mod m c)both d)None

1. Which of the following is Linear probing function\_\_\_\_\_\_\_\_\_\_\_\_[ ]

a) h1 (k,i) = (h(k)+ i 2 ) mod m b) h1 (k,i) = (h(k)+ i) mod m c)both d)None

1. What is a hash function?  
   a) A function has allocated memory to keys  
   b) A function that computes the location of the key in the array  
   c) A function that creates an array  
   d) A function that computes the location of the values in the array