2712_IT_Sem-III_R19_DSA_Inst. Name

1) The Question Paper will have MCQs (for 20 marks) and Subjective/Descriptive Questions (for 60 marks).

2) MCQ correct options and subjective question answers to be written on A4 size papers. Scan all pages of answer papers of Q.1 to Q.4 and create single file in pdf format to upload in the link given.

* Required

1. Enter your Name *

2. Enter your Seat Number *

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Q.1) 1 to 3

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	An array is?
Option A:	Random access structure
Option B:	Sequential access structure
Option C:	Random and sequential both type of structure
Option D:	Other type of data structure but neither random nor sequential type structure
2.	Which type of linked list does not store NULL in the address field?
Option A:	Singly linked list
Option B:	Doubly Linked Lists
Option C:	Circular linked list
Option D:	Priority linked list
3.	A type of queue where input is allowed from both ends and output is allowed from only one end is called as?
Option A:	Input Restricted Deque
Option B:	Output Restricted Deque
Option C:	Priority Queue
Option D:	Circular queue

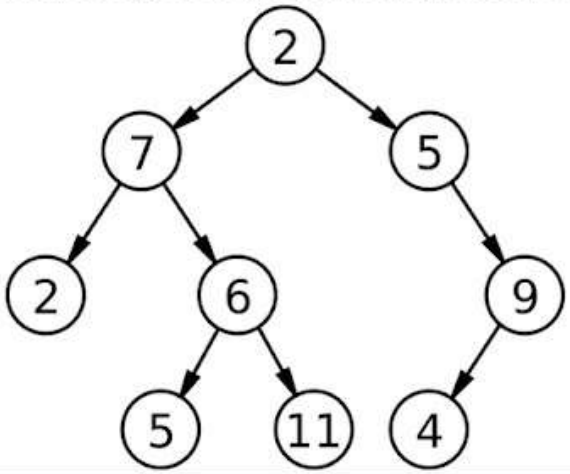
Q.1) 4 to 7

4.	The depth of the root node in the tree is?
Option A:	0
Option B:	1
Option C:	2
Option D:	3
5.	If on a tree preorder traversal is performed it will result in?
Option A:	Breadth First search result
Option B:	Depth First search result
Option C:	Prefix expression
Option D:	Data sorted in ascending order
6.	A graph where edges can be treated in both directions between vertices is called as?
Option A:	Un-weighted graph
Option B:	Undirected graph
Option C:	Directed graph
Option D:	Weighted graph
7.	A graph where an edge exists from all vertices to all other vertices is called as?
Option A:	Complete graph
Option B:	Connected graph
Option C:	Directed graph
Option D:	Digraph

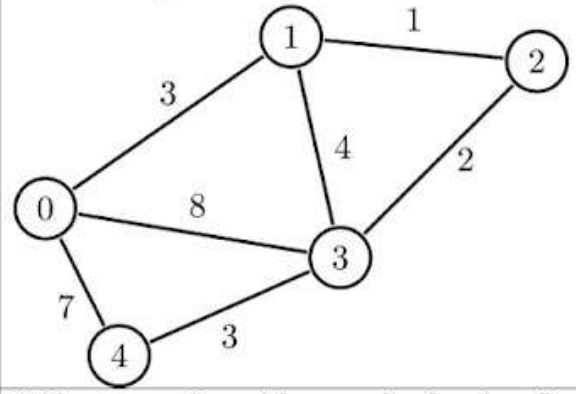
Q.1) 8 to 10

8.	In the worst case of linear search, how many comparisons will be made, in case of N data set?
Option A:	0
Option B:	1
Option C:	N-1
Option D:	N
9.	If the data set is {123, 12, 23, 22, 54, 56, 45}, storage size is 10 where indexing starts from 0 then in hashing by "mid square method", how many collisions will occur? In case of even count of digits consider left as middle.
Option A:	0
Option B:	1
Option C:	2
Option D:	3
10.	Which of the following methods will not suffer from the fragmentation?
Option A:	Allocating the first free block that is large enough to fulfill the request
Option B:	Traversing the whole free memory list and allocating the block which is closest in size of memory requested
Option C:	Allocating the free block equal in size as required by the process
Option D:	Allocating the block in the multiple of fixed size

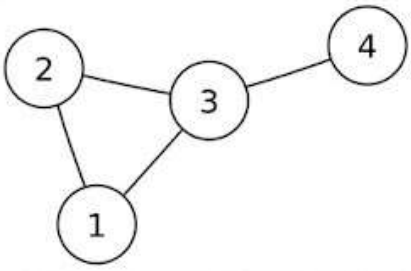
Q.2) A & B

Q2.(20 Marks)	**Solve any Four out of Six** **5 marks each**
A	With an example explain the queue data structure and operations on queue.
B	What are the different tree traversal methods? Write an algorithm for preorder traversal and find the preorder traversal path for the following tree. 

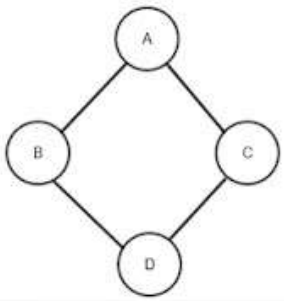
Q.2) C, D, E & F

C	Find the minimum spanning tree, with cost at each step, for the following graph using Kruskal's algorithm. 
D	With an example explain recursive function, flow control in recursive function, winding and unwinding phase in the recursive call.
E	Write an algorithm for Binary search and perform the binary search for 99 in the data set 21, 6, 43, 45, 38, 31, 53, 72, 80
F	Construct the Huffman tree for DATASTRUCTURES and state the bits saved in case each character requires 8 bits.

Q.3

Q3.(20 Marks)	**Solve any Four out of Six 5 marks each**
A	With an example explain the double ended queue data structure. Also write computer world applications of double ended queue.
B	What is an AVL tree, step by step construct AVL tree for following data 23, 12, 25, 01, 45, 63, 27, 29
C	What are the two different graph representation techniques? Also represent the following graph in both ways. 
D	With examples explain each of the first fit, best fit and worst fit sequential methods in storage management.
E	What is a collision? What are collision resolution techniques? Explain with an example double hashing collision resolution technique.
F	Write an algorithm to convert infix expression to postfix expression. Using the same algorithm convert the following infix expression to postfix expression. ((A * (B + C)) / D)

Q.4

Q4.(20 Marks)	**Solve any Four out of Six** **5 marks each**
A	With an example explain the working of doubly linked list and operations on doubly linked list.
B	With examples explain the following tree terminologies: child node, descendant nodes, indegree of node, siblings and decision tree.
C	Write an algorithm for DFS traversal on a graph. Apply and find the DFS on the following graph. 
D	With respect to storage management, explain with example the following terminologies: Boundary tag method, binary buddy system, fibonacci buddy system.
E	Write an algorithm for insertion sort and perform the insertion sort on following data. 69, 88, 19, 58, 46, 12, 16, 4, 67
F	Write an algorithm for reversal of string as a stack application and give an example to explain the same.

3. Upload your answer papers *

   Files submitted:

4. Have you uploaded required pdf file of answers? *

   Mark only one oval.

   ◯ Yes