

Seat No. : _____

MB-111

March-2019

B.C.A., Sem.-III

CC-202 : Data Structures (Old & New Course)

Time : 2:30 Hours]

[Max. Marks : 70

1. (A) Answer the following :

- (1) Define data structure. Give its classification with example. 7
- (2) What is a prerequisite to implement Binary search ? Write algorithm for Binary search. 7

OR

- (1) List various sorting methods. Explain bubble sort with example.
- (2) What is a linked list ? Explain types of linked list with its representation and example.

(B) Attempt any **four** :

4

- (1) _____ are used to manipulate data contained in the data structure.
 - (a) Algorithms
 - (b) Programs
 - (c) Array
 - (d) None of these
- (2) First node in a linked list is known as _____.
 - (a) PTR
 - (b) START
 - (c) END
 - (d) STOP
- (3) _____ means sorting two sub-arrays recursively using merge sort.
 - (a) Divide
 - (b) Conquer
 - (c) Combine
 - (d) None of these
- (4) In a bubble sort method for sorting N elements, _____ passes are required.
 - (a) N
 - (b) N - 1
 - (c) N + 1
 - (d) 2N
- (5) A _____ matrix has relatively few non-zero elements.
 - (a) Unit
 - (b) Binary
 - (c) Linear
 - (d) Sparse
- (6) _____ Data structure has fixed size.
 - (a) Array
 - (b) Linked List
 - (c) Tree
 - (d) Graph

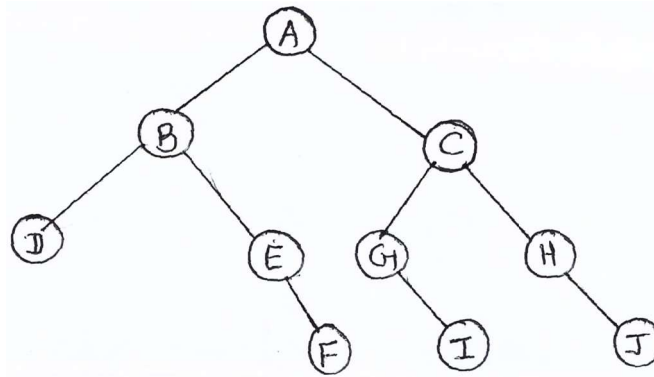
2. (A) Answer the following :
- (i) List various notations of stack. Convert following infix expression into postfix.
 $(A + B) * C - (D - E) * (F + G)$ 7
- (ii) What is queue ? List and explain different types of queue. 7

OR

- (i) What is stack ? Explain stack operations. Draw stack structure of each case when following operations are performed on an empty stack.
 Add A, B, C
 Delete Top element
 Add D
 Add E
- (ii) Write an algorithm to insert an element in a circular queue.
- (B) Attempt any **four** : 4
- (1) Prefix expression of infix $(A + B) - (C * D)$ is _____.
 (a) $-+AB * CD$ (b) $-AB + CD*$
 (c) $-*CD + AB$ (d) None of these
- (2) Stack is also called _____ data structure.
 (a) LIFO (b) FILO
 (c) FIFO (d) LILO
- (3) A line in a grocery store represents
 (a) Array (b) Linked List
 (c) Stack (d) Queue
- (4) An _____ allows insertion to be done at only one end, while deletion operation to be done at both the ends.
 (a) Input Restricted Dequeue
 (b) Output Restricted Dequeue
 (c) Both (a) & (b)
 (d) None of these
- (5) _____ operation deletes an element from stack.
 (a) Push (b) Pop
 (c) Peep (d) Display
- (6) Elements can be deleted at the _____ of the queue.
 (a) Top (b) Front
 (c) Bottom (d) None

3. (A) Answer the following :

- (1) Define Tree and Binary tree. Give in-order, pre-order and post-order for the following Binary tree. 7



- (2) Explain Binary Search Tree in detail. Draw BST for the following data. 30, 25, 45, 27, 40, 100, 10, 68, 18, 76. 7

OR

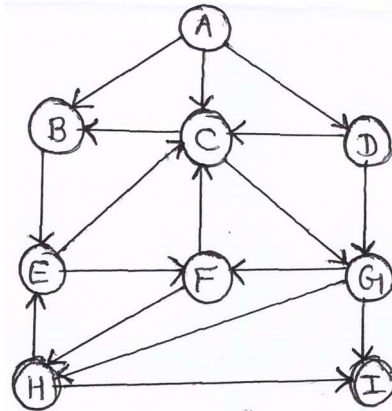
- (1) Write a short note on AVL tree with its types and rotations.
(2) Explain heap tree with its types and example.

(B) Attempt any **three**. 3

- (1) Tree is _____ data structure.
(a) Linear (b) Non-linear
(c) Primitive (d) None of these
- (2) When new node is inserted in the right sub-tree of the critical node, then __ rotation is done.
(a) LL (b) RR
(c) LR (d) RL
- (3) In a _____, all leaf nodes are at the same level.
(a) BST (b) MST
(c) B-Tree (d) Threaded Binary Tree
- (4) The sequence for post-order traversal is _____.
(a) Root-Left-Right (b) Left-Root-Right
(c) Left-Right-Root (d) None of these
- (5) The nodes with no successor are called _____.
(a) End nodes (b) Final nodes
(c) Terminal nodes (d) Last nodes

4. (A) Answer the following :

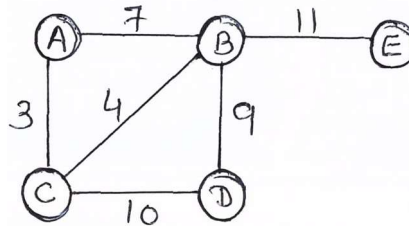
- (1) Consider the given graph G to find out its depth first traversal scheme. Consider node H as a starting node. 7



- (2) What is Graph ? Give its representation with proper example. 7

OR

- (1) Write a note on Dijkstra's algorithm.
 (2) What is MST ? Find MST for the following graph using Prim's algorithm.



(B) Attempt any **three**. 3

- (1) A _____ is collection of vertices and edges.
 (a) Graph (b) Tree
 (c) Source (d) Array
- (2) The term optimal means _____.
 (a) Shortest (b) Cheapest
 (c) Fastest (d) All of above
- (3) _____ algorithm is an example of greedy algorithm.
 (a) Prim's (b) Dijkstra's
 (c) Kruskal's (d) None of these
- (4) MST stands for _____.
 (a) Maximum Span Tree (b) Minimum Spanning Tree
 (c) Multi Spanning Tree (d) My Span Tree
- (5) Total numbers of edges containing the node u are called _____.
 (a) Degree (b) In-degree
 (c) Out-degree (d) None of these