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Seat No. :

1/12/23

DA-105

December-2023

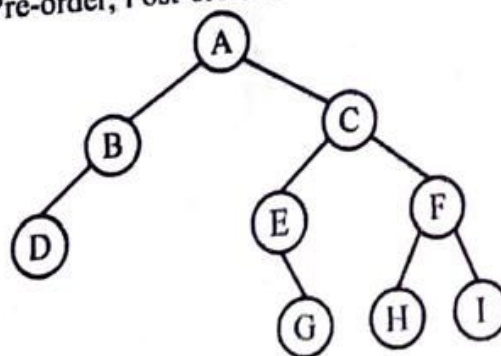
B.C.A., Sem.-III

CC-202 : Data Structures
(New Course)

[Max. Marks : 70]

Time : 2½ Hours]

1. Write the following :
 - (1) What is singly link list ? Write an algorithm to insert an element at front in singly link list. 7
 - (2) What is sorting ? Explain bubble sorting with suitable example. 7
- OR**
1. (1) What is Data Structure? Explain classification of data structure in detail. 7
(2) What is searching ? Explain Binary search in detail. 7
2. Write the following :
 - (1) Explain types of Queue with example. 7
 - (2) What is Stack ? List and explain stack operations with algorithm. 7
- OR**
2. (1) Write an algorithm to insert and delete an element in the Circular Queue. 7
(2) Convert the following infix expression to postfix expression : 7
 $Z + [Y * X - (W/V^Y) * T] * S$
3. Write the following :
 - (1) Write a short note on Binary search tree and create binary search tree using following data elements. 7
45, 20, 50, 15, 34, 65, 35, 12, 87, 54, 62, 85 7
 - (2) Write a short note on AVL Tree. 7
- OR**
3. (1) Find In-order, Pre-order, Post-order traversal for the below binary tree. 7



- (2) Explain Heap Tree with its type.

4. Write the following :
- (1) What is graph ? Explain different graph representation. 7
 - (2) Explain Kruskal's algorithm in detail. 7
- OR**
4. (1) Explain Depth First Search (DFS) traversal with example. 7
 - (2) Explain Prim's algorithm with example. 7
5. Attempt any seven out of twelve : 14
- (1) Process of inserting an element in stack is called _____.
 - (a) Create (b) Push
 - (c) Evaluation (d) Pop
 - (2) In a stack, if a user tries to remove an element from empty stack it is called _____.
 - (a) Underflow (b) Empty collection
 - (c) Overflow (d) Garbage Collection
 - (3) The postfix form of $A*B+C/D$ is ?
 - (a) $*AB/CD+$ (b) $AB*CD/+$
 - (c) $A*BC+/D$ (d) $ABCD+/*$
 - (4) Which data structure is needed to convert infix notation to postfix notation ?
 - (a) Branch (b) Tree
 - (c) Queue (d) Stack
 - (5) A queue follows _____.
 - (a) FIFO (First in First Out) principle
 - (b) LIFO (Last in First Out) principle
 - (c) Ordered array
 - (d) Linear tree
 - (6) A normal queue, if implemented using an array of size MAX_SIZE, gets full when
 - (a) $Rear = MAX_SIZE - 1$ (b) $Front = (rear + 1) \bmod MAX_SIZE$
 - (c) $Front = rear + 1$ (d) $Rear = front$
 - (7) _____ refers to a linear collection of data items.
 - (a) List (b) Tree
 - (c) Graph (d) Edge
 - (8) Which of the following is non-linear data structure ?
 - (a) Trees (b) Stacks
 - (c) List (d) Strings
 - (9) A graph is said to be complete if there is no edge between every pair of vertices.
 - (a) FALSE (b) TRUE
 - (10) What will be the value of top, if there is a size of stack STACK_SIZE is 5 ?
 - (a) 5 (b) 6
 - (c) None (d) 4
 - (11) In BFS, how many times a node is visited ?
 - (a) Once
 - (b) Twice
 - (c) Equivalent to number of indegree of the node
 - (d) Thrice
 - (12) Which one of the following techniques is not used in the Binary tree ?
 - (a) Randomized traversal (b) Preorder traversal
 - (c) Postorder traversal (d) Inorder traversal