R15/R13

Code No: 123BP/113BP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, March - 2021
DATA STRUCTURES
(R15 - Common to CSE, IT; R13 - Common to CSE, IT)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Define data structure. Discuss different types of data structures and their application.
b) Write an algorithm to insert new node at the beginning and at the end of a Singly Linked List. [7+8]

2.a) Explain the procedure to evaluate postfix expression. Evaluate the following Postfix expression 7 3 4 + - 2 4 5 / + * 6 / 7 +.
b) Write an algorithm to push and pop an element from linked stack. [7+8]

3.a) What is a binary tree? Construct a binary tree given the pre-order traversal and in-order traversals as follows:
Pre-Order Traversal: G B Q A C K F P D E R H
In-Order Traversal: Q B K C F A G P E D H R
b) What is a graph? Explain the properties of graphs. [7+8]

4.a) Rearrange following numbers using quick sort: 10, 6, 3, 7, 17, 26, 56, 32, 72.
b) Discuss in detail about Linear and Binary search. [7+8]

5. Develop a binary search tree resulting after inserting the following integer keys 49, 27, 12, 11, 33, 77, 26, 56, 23, 6.
a) Check whether the tree is almost complete or not?
b) Determine the height of the tree
c) Write post order and preorder traversals. [5+5+5]

6.a) What is an array? Discuss different types of array with examples.
b) Explain polynomial addition using arrays. [7+8]

7.a) Convert following expression x+(y*z)–((n*m+o)/p) into post form.
b) Discuss sparse matrix representation using linked list. [7+8]

8.a) Show that the maximum number of nodes in a binary tree of height H is 2^{H+1}-1.
b) Write breadth first traversal algorithm. Explain with an example. [7+8]

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