



SNS COLLEGE OF TECHNOLOGY

(Autonomous)

MCA - Internal Assessment – I (November 2023)

Academic Year 2023-2024(ODD)

First Semester

23CAT602 - DATA STRUCTURES AND ALGORITHMS

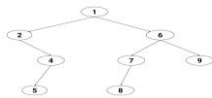
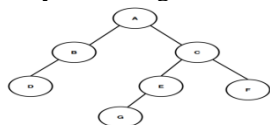
Time: 1^{1/2} Hours

Maximum Marks: 50

Answer All Questions

PART - A (5 x 2 = 10 Marks)

- Define Data Structure and its types with neat diagram.
- Differentiate array and structure in data structure with its declaration and initialization.
- Compare stack and queue with real time applications.
- List the types of Binary Tree.
- Analyze the height of the following binary trees.



PART-B (13 +13+14=40 Marks)

- Write a program to implement Stack operations.
 - Suppose an array contains elements {12, 14, 22, 32, 35, 44, 55}. Give the steps to PUSH and POP all the elements into stack and explain it.
- Identify the operations on Binary Tree and also two types of searching operation in Binary Tree.
 - Construct binary tree for Infix, Prefix and Postfix notation
- Examine how the queue operations are used to transfer the data packets over the network.
 - Consider n number of Router's are installed in an origination. If the sequence of Router No's are (45,15,79,90,10,55,12,20,50). Analyze a Binary search tree for tracking the Router installed easily.

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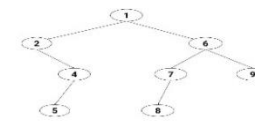
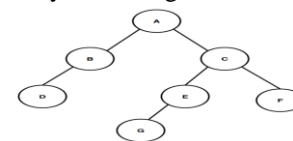
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1	Define Stack ADT and list down its applications.	CO1	Rem
2	Demonstrate accessing structure member with its declaration.	CO1	Und
3	Distinguish between array and structure in Data Structure.	CO1	Ana
4	List the applications of Binary Tree.	CO2	Rem
5	Justify that the root node having ancestor, if yes.	CO2	Ana

PART-B (13 +13+14=40 Marks)

6	(a) Analyze about Stassen's Matrix Multiplication and its formula with example. (Or)	CO1	Ana
	(b) Analyze queue in depth using an example and its implementation.	CO1	Ana
7	(a) Construct binary tree to convert a given infix expression to postfix expression? Trace the steps involved in converting the given infix expression ((A +B)^C)-(D*C)/F) to postfix expression. (Or)	CO2	Eva
	(b) Explain in detail about Operations of Binary tree with neat diagram	CO2	Eva
8	(a) Examine how the Stack operations are used to trace the browsing history of users by the web browser. (Or)	CO1	Ana
	(b) A person is planning to perform visit to different places. The connection between the places is represented in a tree as given below.	CO2	Ana

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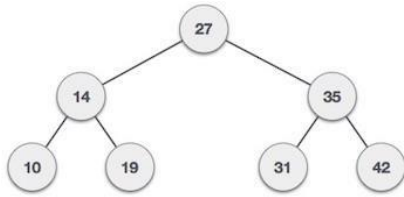
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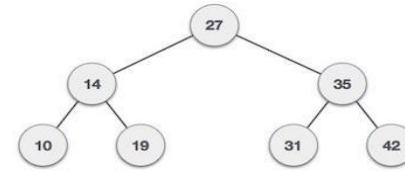
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Assume the different ways followed by him to perform the different types of traversal for all the node places?



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