

[4]

8. Explain in brief about tree traversal. The inorder and preorder traversal of tree produces the following sequence of nodes

Inorder : EACKFHDBG

Preorder : FAEKCDHGB

Draw the tree T.

9. Explain in brief about Binary search Tree ? Construct a binary search tree from the given value.

45, 23, 29, 85, 92, 7, 11, 35, 49 and 51

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Roll No.....

Total No. of Questions : 9]

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BCA -302 (N)

Bachelor of Computer Applications

(Third Semester)

EXAMINATION, MARCH - 2021

(New Course)

Paper Second

**DATA STRUCTURE
USING C AND C++**

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt questions from all sections as directed.

Inst. : The candidates are required to answer only in serial order. If there are many parts of a question, answer them in continuation.

Section -A

(Short Answer Type Questions)

Note : All questions are compulsory. Each question carries 3 marks.

- 1 (a) Write two applications of Linked Lists.
- (b) What is a sparse Matrix ?

P.T.O.

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- (c) Explain complete Binary tree and Extended Binary tree.
- (d) How the following polynomial can be represented using linked list ? Show
 $8x^3y^3 + 6x^2y - 4xy^2 + 2xy - 2$
- (e) Evaluate the following postfix expression
 $5, 7, 9, *, +, 4, 9, 3, 1, *, -$
- (f) Differentiate between a max-heap and min-heap.
- (g) What is recursion and explain with example.
- (h) What is a tree ? Write the difference between tree and binary tree. Find the height of binary tree.
- (i) How does the quick sort work ? Explain.

Section -B

Note : Attempt any 2 questions. Each question carries 12 marks.

- 2. Give an algorithm to perform following operations in a singly linked list
 - (i) Insert a new node after a given node.
 - (ii) Delete last node.

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- 3. Define Stack. Convert the expression infix to prefix using stack
 $A * (B + D) / E - F * (G + H / K)$
- 4. Write a program to sort the following elements.
 $77, 49, 25, 12, 9, 33, 56, 81$
 using bubble sort.
- 5. Explain circular queue and double ended queue with example.

Section -C

Note : Attempt any 2 questions. Each question carries 12 Marks.

- 6. Define Hashing. What are the properties of a good hash function ? With necessary examples explain four different hashing techniques.
- 7. Create a B-Tree of order 5 by inserting the following elements :
 $3, 14, 7, 1, 8, 5, 11, 17, 13, 16, 23, 12, 20, 26, 4, 6, 18, 24, 25, \text{ and } 19.$

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P.T.O.