

Roll No. 0902263

BCA-302(N)

B. C. A. (Third Semester)
EXAMINATION, Nov./Dec., 2018

(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.

- (A) Define Primitive operations of D-Queues.
- (B) Define mathematical expression by In Order Binary tree with suitable assumption. Choose expression which expressed by three level tree.
- (C) Differentiate two-way search tree and A. V. L. tree.

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- (D) Define Hashing, with consideration of various Hash functions.
- ~~(E)~~ Write down functional program for linear searching.
- (F) What are the use of headers in doubly link list?
- ~~(G)~~ How is sparse array defined for lower and upper triangular matrices?
- ~~(H)~~ Convert prefix expression $+ * xy - /ab \times c$ to equivalent postfix expression.
- ~~(I)~~ Design recursive functional codes for three traversals of a Binary tree.

Section—B

(Long Answer Type Questions)

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

- Discuss operation on two way link list in detail. Design functional code for any two operations.
- Discuss the algorithm for conversion of Infix mathematical expression to Postfix mathematical expression.
- Discuss the following by suitable example of binary tree:
 - Balance factor
 - Level
 - No. of node of complete tree
 - Rotation
 - Intermediate and leaf node
 - Heap

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- Prepare six-way search B-tree for the following list of key elements (Railway Station codes):

ETW, CNB, FBD, LKO, SPC, LMP, SCC, LJM, PHD, FTP, PNK, GOV, AMS, CPA, CPB, KJN, KJNC, KYP, RPO, ZBD, ZP, ZARP.

Section—C

(Long Answer Type Questions)

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

- Define Quick sort. Write algorithm for quick sorting of 25 numerical distinct values.
- Discuss BST in detail. What are feature of BST? When we prepare BST from list of nodes, then which types of rotation are considered during insertion? Discuss any two rotations in detail.
- ~~8.~~ Perform Heap sorting for the following list of characters:

B, L, M, A, P, C, Z, U, V, W, X, Y, Z, Q, R, N, J, G, D, I, X
- Define statement of problem for B-tree.
 - Define different approach for tree indexing.
 - Discuss top-down and bottom-up approach of sorting in detail.

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Handwritten notes on the second page:

ABC DEFGHIJKL
 MNOP QRSTUVW
 XYZ
 3200