

# 301/331 B.C.A. (Part-III) Data Stru. (Using C/C++)

## B.C.A. (Part-III) EXAMINATION - 2022

(Faculty of Science)

(Three-Year Scheme of 10+2+3 Pattern)

### DATA STRUCTURE (Using C/C++)

Time Allowed : 3 Hours

Maximum Marks : 100

*No supplementary answer-book will be given to any candidate. Hence the candidates should write their answer precisely in the main answer-book only.*

*Answer of all the questions (short answer as well as descriptive) are to be given in the main answer-book only. Answers of short answer type questions must be given in sequential order. Similarly all the parts of one question of descriptive part should be answered at one place in the answer-book. One complete question should not be answered at different places in the answer-book.*

*Write your roll number on question paper before start writing answers of questions.*

Question paper consists of **three** parts.

All **three** parts are **compulsory**.

**Part - I :** (Very Short Answer) consists 10 questions of 2 marks each. Maximum limit for each question is upto 40 words.

**Part - II :** (Short Answer) consists 5 questions of 4 marks each. Maximum limit for each question is upto 80 words.

**Part - III :** (Long Answer) consists 5 questions of 12 marks each with internal choice.

#### PART - I

1. Very Short Answer :

10x2=20

- ~~(a)~~ What is an Algorithm ?
- ~~(b)~~ Explain an Array in Data structure.
- (c) Define polish notation.
- ~~(d)~~ Write advantages of Double Linked List over Single Linked List.
- (e) Write difference between Tree and Graph.
- ~~(f)~~ Explain Binary Tree with diagram.
- (g) What is adjacency matrix in Graph ?
- ~~(h)~~ Differentiate between directed and undirected graphs .
- (i) What is hashing ?
- (j) Write time complexity of merge sort in all cases.

**PART - II**

2. Short Answer : 5x4=20
- (a) Explain Efficiency of an algorithm with example.
  - (b) What is Linked List ? Explain doubly linked list with diagram.
  - (c) Write Huffman's algorithm.
  - (d) Explain shortest path in Graph with example.
  - (e) Write an algorithm of Linear search for one dimension array.

**PART - III**

3. ~~What is Stack?~~ Write the procedure of PUSH and POP operation in Stack. 4+8
- OR**
- What is Queue ? Explain types of queue and its operation. 4+8
4. Explain Circular linked list. Write an algorithm for inserting and deleting a node in circular linked list. <https://www.uoronline.com> 4+8
- OR**
- ~~Explain Infix, Prefix and Postfix expression. Convert the following infix expression into postfix expression using stack.~~ 6+6
- $((A+B) - C*(D/E)) + F$ .
5. ~~What is Binary Search Tree (BST)?~~ Write an algorithm for searching into Binary Search Tree. 4+8
- OR**
- ~~Explain Tree Traversal in detail with example.~~ 12
6. Explain graph traversal-BFS and DFS with example. 12
- OR**
- Write Warshall's algorithm with diagram. 12
7. What is binary search ? Write advantages of binary search over linear search. Write complexity of binary search. 4+4+4
- OR**
- What is heap ? Write an algorithm for Heap sort. 12

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