B.C.A. (Part-III)   **Data Stru. (Using C/C++)**

301

B.C.A. (Part-III) Examination, 2021

(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 the 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 :

(a)   What is big.O notation in data structure?

(b) What is the difference between stack and queue?

(c) Write algorithm to find middle of linked list.

(d) Write a difference between circular linked list and doubly linked list.

(e) What is the time complexity of insertion. deletion and searching an element in binary tree and binary search tree?

(f) Define huffman algorithm.

(g) Write a difference between Adaptive and Non-adaptive algorithm of sorting.

(h) What is binary search?

(i) Write basic operations of array in data structure.

(j) Define classification of data structure.

PART-II

2. Convert the following infix expression into prefix expression :

   (i) 2 + 3 * 4 – 5

   (ii) 2 + 3/5 ^ 6 – (4 * 5)

   (iii) A AND B + C ∧ D OR E AND F

   (iv) –2 + 3 * 4 ∧ (5/3) + NOT 7

3. Define Deque and its variations.

4. Write some of the properties of binary tree.

5. Write short notes on

   (i) Bubble sort

   (ii) Merge sort

   (iii) Quick sort

   (iv) Selection sort.

6. Explain depth first search of traversing a graph.

PART-III

7. Explain the concept of dynamic memory allocation.

OR

How is linked list different from arrays as data structure?

8. What is stack? Explain the pop and push operation of it

OR

Write an algorithm to add a item to a circular queue.

9. Explain the process of deleting a node from binary tree using example.

OR

What is adjacency matrix? How is it made?

10. Write an algorithm for :

    (i) Binary search

    (ii) Sequential search.

OR

What is the difference between :

    (i) Directed and Undirected graph?

    (ii) BFS and DFS?

11. What are the various operations possible on a doubly linked list? Explain with the algorithm.

OR

Write an algorithm to create Binary search tree.

*****