

Total Pages : 04

Roll No. :

BCA-06

Data Structure through C Language

Bachelor of Computer Application (BCA-11/16/17)

2nd Semester Examination June 2022

Time : 2 Hours

Max. Marks : 80

Note : This Paper is of Eighty (80) marks divided into two (02) Section A and B. Attempt the questions contained in these sections according to the detailed instructions given there in.

Section-A

(Long Answer-type questions)

Note: Section 'A' contains Five (05) Long-answer type questions of Twenty (20) marks each. Learners are required to answer any two (02) questions only.

(2 x 20 = 40)

- Q.1. a. Explain linear and binary search.
b. What do you mean by stack overflow and stack underflow.
c. Why a linked list are called dynamic data structure?
d. Explain algorithm.
e. What do you mean by efficiency of algorithm?

P.T.O.

Q.2 Consider the following arithmetic expression P written in postfix notation.

P:12,7,3,-/,2,1,5,+,* ,+

- i. Translate P, by inspection and hand into its equivalent infix expression.
- ii. Evaluate the infix expression.
- iii. Evaluate the postfix expression P using stack.

Q.3 Explain the prerequisites of Heap sort? Illustrate the execution of heap sort on the array

A=<44,30,50,22,60,55,70,55>

Q.4 How would you implement a circular queue of integers in C using array. Write routines to implement appropriate operations for it. Also differentiate dequeue and priority queue?

Q.5 Write short notes on :

- i. File organization
- ii. M-way search tree

P.T.O.

Section-B

(Short Answer-type questions)

Note: Section 'B' contains Eight (08) Short-answer type questions of ten (10) marks each. Learners are required to answer any four (04) questions.

(4 x 10 = 40)

- Q.1 What is a data structure? List out the areas in which data structures are applied extensively?
- Q.2 Define abstract data types. Explain it briefly?
- Q.3 Derive and explain in brief a formula to obtain an address of any element in 3-dimensional array stored in row-major order.
- Q.4 Define two way linked lists. Discuss the advantages of two way linked list over one way linked list in case of deleting a node whose location LOC is given.

P.T.O.

- Q.5 What is complexity? What do you understand by worst case time complexity of an algorithm? Explain.
- Q.6 Write a C program which sorts a list of n items using selection sort method. Illustrate giving an example.
- Q.7 State the Tower of Hanoi Problem. Write recursive algorithm to solve the problem.
- Q.8 Explain Quick sort? Sort the given values using Quick Sort? 65 70 75 80 85 60 55 50 45

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