



SN – 671

III Semester B.C.A. Degree Examination, November/December 2017  
(Y2K8 Scheme) (Repeaters)  
BCA 305 : DATA STRUCTURES USING C

Time : 3 Hours

Max. Marks : 60/70

- Instructions:** 1) Answer all the Sections.  
2) Section – D is applicable only to students who have taken admission from 2012 – 13 and Onwards.

SECTION – A

I. Answer any ten questions : (10×1=10)

- 1) Define data structures.
- 2) What is a pointer ?
- 3) Convert the following infix expression to postfix expression.  
(X + Y) \* (P – Q)
- 4) What is Binary Search Tree ?
- 5) Define a queue.
- 6) Define degree of a node.
- 7) Mention any two advantages of linked list over arrays.
- 8) What is singly linked list ?
- 9) Define complete binary tree.
- 10) What are the types of priority queue ?
- 11) What is meant by leaf node ?
- 12) Define height of a binary tree.

SECTION – B

II. Answer any five questions : (5×3=15)

- 13) Differentiate between recursion and iteration.
- 14) Explain malloc(), calloc() and free() functions.

P.T.O.



- 15) Define recursion. Write a recursive algorithm to find the factorial of a given number.
- 16) List the three rules of tower of Hanoi problem.
- 17) Explain doubly linked list and circular linked list with an example.
- 18) Explain the properties of binary tree.
- 19) Explain the concept of selection sort technique with an example.
- 20) Write a program to generate Fibonacci series.

## SECTION – C

III. Answer **any five** questions : (5×7=35)

- 21) Explain call-by-value and call-by-reference with an example.
- 22) Define a stack. Write algorithm to perform push and pop operation.
- 23) Write an algorithm to sort n elements using bubble sort technique with an example.
- 24) What is a dequeue ? Explain the variations of dequeue.
- 25) Sort the following numbers using merge sort technique.  
21 12 34 3 7 11 9 23 4
- 26) Write an algorithm to :
  - a) Insert a node at the beginning of linked list. 3
  - b) Delete a node from the end of linked list. 4
- 27) What is tree traversal ? What are different types of traversals ? Explain with an example.
- 28) Compare linear and binary search techniques.

## SECTION – D

IV. Answer **any one** question : (1×10=10)

- 29) Explain classification of data structures.
  - 30) Write an algorithm to implement quick sort. Trace the algorithm for the given data :  
42 8 16 4 21 12 9 10
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