SN – 671

29

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