Roll No. .....

BCA-11/BA-IT-12 (Bachelor of Computer Application)

Second Sem Examination-2015

BCA-06

Data Structure Through 'C' Language

Time : 3 Hours **Maximum Marks :** 60

Note : This paper is of sixty (60) marks divided into three (03) sections A, B, and C. Attempt the questions contained in these sections according to the detailed instructions given therein.

Section - A

(Long Answer Type Questions)

Note : Section 'A' contains four (04) long-answer-type questions of fifteen (15) marks each. Learners are required to answer any two (02) questions only. (2×15=30)

1. (a) What is structure? Write appropriate structure definition and variable declarations to store following information about 100 students:

   Name, st_ no, gender, date of birth and marks in three subjects S1, S2, S3. Date of birth should be a structure containing fields day, month, and year. **10**

   (b) What is pointer ? What are the uses of pointers in C? **5**

2. (a) Define data type and abstract data type. Comment upon the significance of both. **10**

(b) Write an algorithm to insert a node in between any two nodes in a linked list. **5**

3. (a) Write an algorithm to count number of nodes in the circular linked list. **5**

(b) What are linked lists? How do they compare with arrays? Give their relative merits of both when certain operations are carried out. **10**

4. (a) Explain various graph traversal schemes and write their merits and demerits. **10**

(b) Write down any four application of a stack. **5**

Section - B

(Short Answer Type Questions)

Note : Section 'B' contains eight (08) short-answer-type questions of five (05) marks each. Learners are required to answer any four (04) questions only. (4×5=20)

1. Convert thc following infix expression into a postfix expression (Show steps)

   A*(B+D) /E-F(G+H/K) **5**

2. Compare linear linked list and double linked list, with diagrams. **5**

3. Write a short note of B Tree? **5**

4. Using array to implement the queue structure, write an algorithm/ program to Insert an element in the queue. **5**

5. Explain the Complexity of an Algorithm. **5**

6. Write down the algorithm of quick sort. **5**

7. Write a short note on dynamic memory allocation. **5**

8. Write a function that accepts a string and return 1 if the string is palindrome else 0 if string is not palindrome without using any built in function. 5

Section - C

(Objective Type Questions)

Note : Section 'C' contains ten (10) objective-type questions of one (01) mark each. All the questions of this section are compulsory. (10×1=10)

1. A technique for direct search is

   A. Binary Search B. Linear Search

   C. Tree Search D. Hashing

2. If a node having two children is deleted from a binary tree, it is replaced by its

   A. Inorder predecessor B. Inorder successor

   C. Preorder predecessor D. None of the above

3. The postfix form of A*B+C/D is

   A. *AB/CD+ B. AB*CD/+

   C. A*BC+/D D. ABCD+/*

4. Quick sort is also known as

   A. merge sort B. heap sort

   C. bubble sort D. none of these

5. A queue is a,

   A. FIFO (First In First Out) list.

   B. LIFO (Last In First Out) list.

   C. Ordered array.

   D. Linear tree.

6. The number of interchanges required to sort 5, 1, 6, 2, 4 in ascending order using Bubble Sort is

   A. 6 B. 5

   C. 7 D. 8

7. The data structure required for Breadth First Traversal on a graph is

   A. queue B. stack

   C. array D. tree

8. The data structure required to evaluate a postfix expression is

   A. queue B. stack

   C. array D. linked-list

9. Representation of data structure in memory is known as:

   A. recursive B. abstracl data type

   C. storage structure D. file structure

10. What is the postfix form of the following prefix *+ab-cd

    A. ab+cd–* B. abc+*–

    C. ab+*cd– D. ab+*cd–