B. C. A. (Sem. IV) Examination

March / April - 2017

BCA - 401 : Data Structure

Time : **3 Hours]**　　　　　　　　　　　　　　[Total Marks : **70**

1 (a) Answer the following :　　　　　　　　　　　**6**
   (1) What do you mean by Algorithm ?
   (2) What is primitive data structure ?
   (3) Define : Array and String.

  (b) Answer the following : (any **two**)　　　　　　**12**
   (1) Explain time and space efficiency of an algorithm with example.
   (2) What is data structure ? Explain non-primitive data structure in detail.
   (3) List out string manipulation functions. Write an algorithm/program to compare two strings.

2 (a) Answer the following :　　　　　　　　　　　**5**
   (1) Write short note on circular queue.
   (2) Compare : Singly linked list and doubly link list.

  (b) Answer the following : (any **two**)　　　　　　**12**
   (1) Write algorithms for stack operations.
   (2) Explain the applications of linked list.
   (3) Write an algorithm to remove an element from singly linked list.

3 **(a)** Define the following terms : **6**
     (1) Graph
     (2) Degree of Node
     (3) Loop
     (4) Complete Binary Tree
     (5) Null graph
     (6) Leaf node

    (b) Answer the following : (any **two**) **12**
     (1) Explain DFS with algorithm and example.
     (2) Explain Tree traversal algorithms with example.
     (3) Explain height and weight balanced tree with example.

4 **(a)** Do as directed : **5**
     (1) Define : Collision
     (2) Define : Hashing
     (3) What do you mean by sequential file ?
     (4) What is sorting ?
     (5) List out all hashing functions.

    (b) Answer the following : (any **two**) **12**
     (1) Explain Binary search technique with algorithm.
     (2) Write an algorithm to sort data using insertion sort.
     (3) Explain Bubble sort with suitable example.

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