NBM-003-10120010 Seat No. _____

B. Sc. (Sem. II) (CBCS) Examination

March / April - 2017

Computer Application : Paper - CS - 201

(Data Structures)

Faculty Code : 003

Subject Code : 10120010

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 (a) Answer the following objective questions: **4**

(All compulsory)

(1) What is a subscript in an Array ?

(2) The array name is always the ____ address of the array.

(3) What is Dynamic Memory Allocation ?

(4) Which data structures are considered as non-primitive data structures ?

(b) Answer in brief : (Any 1 out of 2) **2**

(1) What is 2-D Array ?

(2) What are * and & operators in Pointers known as ?

(c) Answer in detail : (Any 1 out of 2) **3**

(1) Write a note on Sparse Matrices.

(2) Differentiate: Primitive vs. Non-primitive data structure.

(d) Write a note on : (Any 1 out of 2) **5**

(1) What is Data Structure ? Explain its categories in detail.

(2) What are Pointers ? Explain the advantages and disadvantages of Pointers.

2 (a) Answer the following objective questions : **4**

(All compulsory)

(1) Define: Expression.

(2) When the push operation is performed on stack the value of TOP will be _____.

(3) Which linked list is a two-way list ?

(4) In singly linked list, last node's link contains _____.

(b) Answer in brief : (Any 1 out of 2) **2**

(1) State the case when `stack overflow' condition occurs.

(2) Solve the given expression using Postftx : (A+B) * (C–D)

(c) Answer in detail : (Any 1 out of 2) **3**

(1) Define: TOS (Top of Stack).

(2) Draw the figure of the circular doubly linked list.

(d) Write a note on : (Any 1 out of 2) **5**

(1) Write a C program to implement Stack data structure and its operations.

(2) Explain doubly linked list in detail.

3 (a) Answer the following objective questions : **4**
(All compulsory)

(1) Which form of access is used to add and remove nodes from a queue ?

(2) How many ends does a queue have ?

(3) Which priorities are assigned by Priority Queues ?

(4) Which Data Structure is used to perform Recursion ?

(b) Answer in brief : (Any 1 out of 2) **2**

(1) What are front and rear pointers in queue ?

(2) What is Recursion ?

(c) Answer in detail : (Any 1 out of 2) **3**

(1) Write an algorithm for insertion in queue using linked list.

(2) Explain types of queue in detail.

(d) Write a note on : (Any 1 out of 2) **5**

(1) Write a C program to implement Recursion to calculate factorial of a given number.

(2) Explain the concept of De-queue in detail.

4 (a) Answer the following objective questions : **4**
(All compulsory)

(1) A graph is a collection of _____ and _____,

(2) What is degree in graph ?

(3) Which type of data structure is tree ?

(4) What are root nodes and leaf nodes in a tree ?

(b) Answer in brief : (Any 1 out of 2) **2**

(1) What is a complete binary tree ?

(2) What is weighted graph ?

(c) Answer in detail : (Any 1 out of 2) **3**

(1) Explain the concept of adjacency list and adjacency matrix.

(2) Explain minimal spanning tree.

(d) Write a note on : (Any 1 out of 2) **5**

(1) Write an algorithm for Depth First Search (DFS) in Graph.

(2) Explain the Traversal techniques on Binary Search Trees.

5 (a) Answer the following objective questions : **4**
(All compulsory)

(1) A sorting technique which compares adjacent elements in a list and switches when necessary is _____ sort.

(2) Which sorting technique is based on `divide and conquer' rule ?

(3) Which search technique begins with search element at the middle of the list ?

(4) The searching technique that works on sorted list(s) is _____.

(b) Answer in brief : (Any 1 out of 2) **2**

(1) Which types of Sorting techniques are there in data structure ?

(2) Define: Index Search.

(c) Answer in detail : (Any 1 out of 2) **3**

(1) Write a note on Selection Sort.

(2) Differentiate: Linear Search vs. Binary Search.

(d) Write a note on : (Any 1 out of 2) **5**

(1) Explain Insertion sorting with Iteration table.

(2) What is Sequential Searching ? Explain with its advantages and disadvantages.
