NBF-003-1032001   Seat No. _____

B. C. A. (Sem. II) (CBCS) Examination

April/May - 2017

CS-07 : Data Structure using C Language

(New Course)

Faculty Code : 003
Subject Code : 1032001

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

1   (a)   Answer the following short questions :   4

   (1)   Data structure which not stores the data sequentially is called _____.

   (2)   Which operator is used to access variable of structure, when we create pointer to structure?

   (3)   Define data structure in one line?

   (4)   Which function is used de-allocate the memory?

   (b)   Answer any 1 of the following questions :   2

   (1)   Define pointer. How to declare pointer, explain with example.

   (2)   Explain Big-oh notation.

   (c)   Answer any 1 of the following questions :   3

   (1)   Explain calloc( ) and malloc( ) functions with example.

   (2)   Explain array as function argument with example.

   (d)   Answer any 1 of the following questions :   5

   (1)   Explain Scope Rules and Storage Class in detail.

   (2)   Write a short note on types and classes of algorithm.

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

    (1) Which algorithm design technique is used in the quick sort?

    (2) The _____ algorithm is a recursive algorithm for traversing graph.

    (3) Which sorting technique is very faster?

    (4) _____ sorting technique is also known as bin sort.

(b) Answer any 1 of the following questions :   **2**

    (1) Explain shortest path problem.

    (2) Write a selection sort algorithm.

(c) Answer any 1 of the following questions :   **3**

    (1) Write a program to sort an array element using bubble sort technique. .

    (2) Explain minimal spanning tree.

(d) Answer any 1 of the following questions :   **5**

    (1) Write an algorithm step to implement Quick Sort.

    (2) Explain DFS with detail.

3 (a) Answer the following short questions :   **4**

    (1) Queue follows _____ method.

    (2) Which data structure has only one end for the insertion and deletion?

    (3) The operation for deleting an element to a Stack is called _____ operation.

    (4) Identify the data structure which allows deletions at both ends of the list but insertion at only one end.

(b) Answer any 1 of the following questions :   **2**

    (1) Differentiate Stack Vs Queue.

    (2) Write down application of Stack and Queue.

(c) Answer any 1 of the following questions :   **3**

   (1) What is priority queue? Explain with example.

   (2) Explain Dqueue with suitable example.

(d) Answer any 1 of the following questions :   **5**

   (1) What is data structure? Explain primitive and non-primitive data structure in detail.

   (2) Write an algorithm to perform Push( ), Pop( ) and Display( ) operations on stack.

4 (a) Answer the following short questions :   **4**

   (1) Which linked list cannot stores the NULL value in the list?

   (2) In a singly linked list if link part of first node is NULL then the list contain _____ node.

   (3) How many fields are there in node of doubly linked list?

   (4) A doubly linked list provides list traversal in _____ direction.

(b) Answer any 1 of the following questions :   **2**

   (1) What is linked list? Explain in brief.

   (2) Write an algorithm to insert node at first position in Singly linked list.

(c) Answer any 1 of the following questions :   **3**

   (1) Explain circular linked list with example.

   (2) State the difference between Singly linked list Vs Doubly linked list.

(d) Answer any 1 of the following questions :   **5**

   (1) Write an algorithm for following operation on Singly Linked List.
      (1) Append
      (2) Insert First
      (3) Display
      (4) Delete Last
      (5) Count

(2) Write an algorithm for following operation in Doubly Linked List

    (1) Create( )

    (2) Insert Last( )

    (3) Display( )

    (4) Sort( )

    (5) Search( )

5 (a) Answer the following short questions :   **4**

    (1) BFS stands for _____.

    (2) A nodes with no children are called _____.

    (3) How many maximum numbers of child nodes are there in binary search tree?

    (4) An empty tree is also a _____ tree.

(b) Answer any 1 of the following questions :   **2**

    (1) What is Complete binary tree? Explain in brief.

    (2) Define root node. leaf node. parent node and child node.

(c) Answer any 1 of the following questions :   **3**

    (1) Explain B-tree with example.

    (2) Explain height balanced tree with example.

(d) Answer any 1 of the following questions :   **5**

    (1) Create a binary tree for the following elements : 15, 12, 6, 9, 24, 13, 29, 20, 27, 10, 8

    Also write the in-order, pre-order and post-order for the same.

    (2) Write a short note on Binary Search Tree and its traversal methods with example.