



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.