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B.Tech. Examination, 2017

(Third Semester)

(C.S. & I.T. Branch)

DATA STRUCTURE USING C

Paper - IV

Time Allowed : Three Hours

Maximum Marks : 100

Note : Attempt any five questions. All questions carry equal marks.

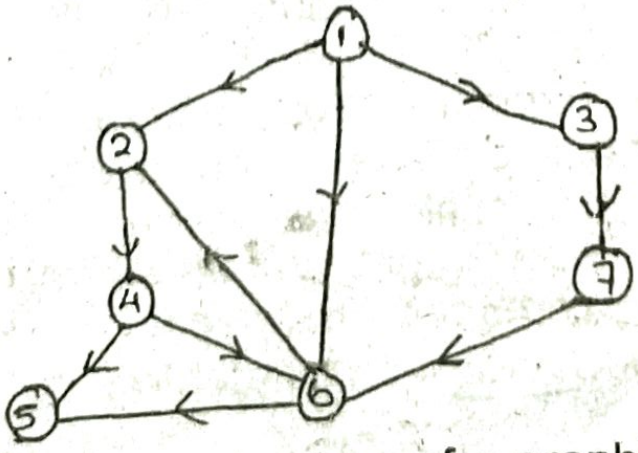
Q. 1. (a) Describe various representation of graph.

(b) Write algorithm for insertion and deletion of an element from a queue.

Q. 2. (a) Discuss the advantages and disadvantages of both link list and arrays.

(b) Describe Prim's minimal spanning tree algorithm.

Q. 3. (a) Create an adjacency matrix and adjacency list for the following graph.



(b) Explain spanning tree of a graph briefly with suitable example.

P.T.O.

Q. 4. (a) Construct a binary tree from the following :
In order : 50, 10, 30, 90, 60, 80, 40, 20, 70
Pre order : 60, 10, 50, 90, 30, 40, 80, 70, 20

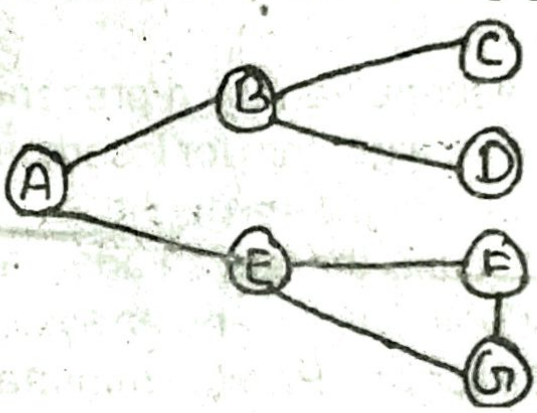
(b) Write an algorithm to convert infix expression to postfix expression. Explain with suitable example.

Q. 5. (a) Simulate the insertion sort sorting algorithm and show the step-by-step procedure to sort the given data values : 23, 11, 37, 15, 19, 28.

(b) What are the parameters on the basis of which an algorithm can be analyzed. Explain in brief.

Q. 6. (a) Create a heap when the values 100, 200, 10, 30, 60, 80, 90, 300 are entered.

(b) What is meant by "Depth First Search" of a graph ? Consider the following graph :



Explain how a Depth First Search scheme will traverse the graph starting at node A ?

Q. 7. (a) Create an AVL tree by inserting the following numbers in the order in which they are given : 17, 25, 19, 23, 75. Draw figure for each step.

(b) Explain indexed sequential file organisation.

Q. 8. Write short notes on any two of the following :

(a) Direct file organisation
(b) Advantages of doubly linked list
(c) Threaded binary tree
(d) Overflow and underflow

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B.Tech. Examination, 2016

(Third Semester)

(C.S. & I.T. Branch)

DATA STRUCTURE USING C

Paper - IV

Time Allowed : Three Hours

Maximum Marks : 100

Note : Attempt any five questions. All questions carry equal marks.

Q. 1. (a) Define algorithm and data structure. Differentiate between linear and non-linear data structure with example.

(b) Write a program to input a n × n matrix and datermine product of diagonal elements.

Q. 2. (a) Write an algorithm to convert an infix notation to a postfix notation using stack.

(b) Write a program to perform insertion and deletion operation on a queue.

Q. 3. (a) Write a recursive program to perform inorder, preorder and postorder traversal on a binary tree.

(b) Implement the Huffman algorithm in C.

Q. 4. (a) Construct the heap for the given values :

97, 53, 59, 26, 41, 58, 31, 16, 21, 36

(b) Write a program to calculate shortest path between two nodes.

Q. 5. (a) What are the different searching techniques available ? Explain binary search.

(b) Explain Dijkstra's algorithm.

Q. 6. (a) Write an algorithm to implement breadth first search.

(b) What is a sparse matrix ? How sparse matrix can be implemented efficiently in memory.

Q. 7. Write short note on :

(i) Warshal algorithm

(ii) Dequeue and priority queue

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B.Tech. Examination, 2015

(Third Semester)

(C.S. & I.T. Branch)

DATA STRUCTURE USING C

Paper – IV

Time Allowed : Three Hours

Maximum Marks : 100

Note : Attempt any five questions. All questions carry equal marks.

Q. 1. (a) Define Data Structure. Define the classification of data structure.

(b) How to express the time and space complexity. Define with the help of example ?

Q. 2. (a) Define static memory allocation and dynamic memory allocation ?

(b) Write a program to input a string and calculate the length of that string.

Q. 3. (a) Write a program to implement push and pop function using array ?

(b) Write a program to input an infix expression and convert it into prefix form ?

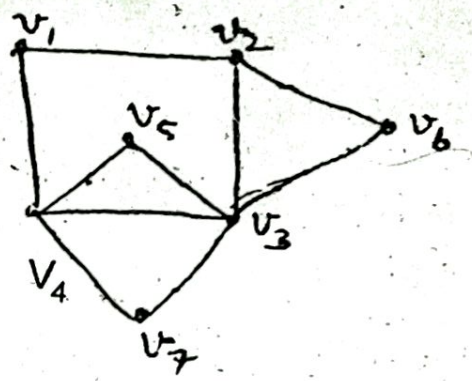
Q. 4. (a) Write a program to generate Fibonacci series ? The user enter the limit of the series with the help of recursion.

(b) Define recursion and types of recursion ?

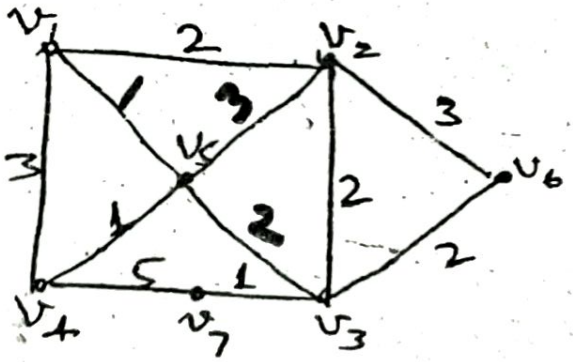
P.T.O.

Q. 5. (a) What do you mean by queue ? Define insert and delete operations performed by queue ?

(b) Give the adjacency matrix and adjacency list representation for the following graph :



Q. 6. (a) Find all possible spanning trees and a minimum spanning tree for the following graph.



(b) Write a function to search a linked binary search tree.

Q. 7. Write short notes on any two of the following :

(a) Heap sort
(b) AVL trees
(c) Konigsberg bridge problem
(d) Hashing function

Sneha

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B.Tech. Examination, 2014

(Third Semester)

(C.S. and I.T. Branch)

DATA STRUCTURE USING C

Paper - IV

Time Allowed : Three Hours

Maximum Marks : 100

Note : Attempt any five questions. All questions carry equal marks.

Q. 1. (a) What is abstract data type ? Explain in brief abstract data type for varying length character.

(b) Find the error in the following proof :

$$O(n) = O(n^2)$$

P.T.O.

Q. 2. (a) What is character string in 'C' ? Write C program to implement the substring operation that set the string "S2" to the j characters beginning at ith position of the first string "S1".

(b) What are the advantages of doubly linked list over singly linked list ? Write an algorithm to delete an element from doubly linked list.

Q. 3. (a) Write a C program to convert the following :

(i) Prefix string to postfix

(ii) Postfix string to prefix

(b) Implement a stack in C in which each item on the stack is a varying number of integers. Choose C data structure for such stack and design PUSH and POP function for it.

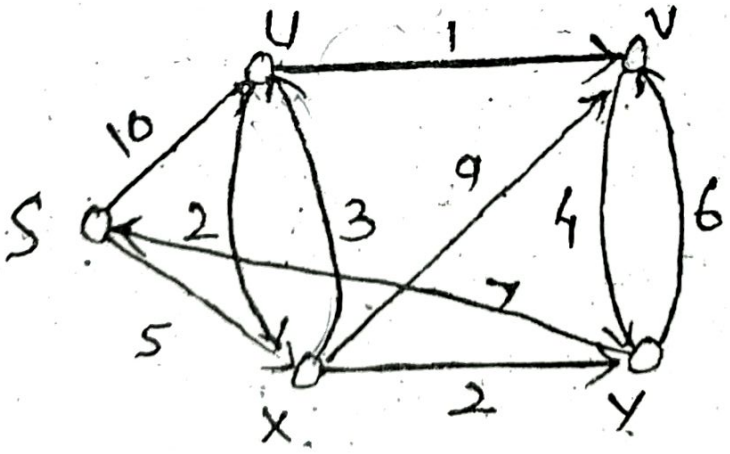
Q.4. (a) Define Queue. How shall a queue be represented in C. Explain and write routines for "empty", "remove" and "insert" operations under circular representation of queue.

(b) Define the term binary tree. Differentiate between binary tree and complete binary tree.

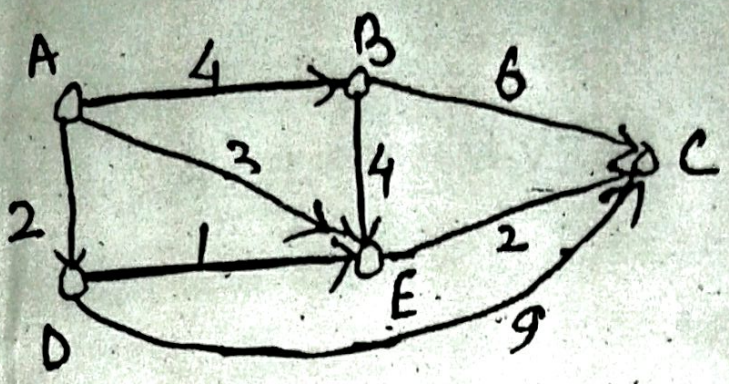
Write down the C function for in-order and post-order traversal of binary tree.

Q. 5. (a) Describe Dijkstra's algorithm for shortest path.

Find the shortest path between S and Y in the following directed graph.



(b) Find the minimum spanning tree of the following graph by Prims algorithm.



Q. 6. (a) Write an algorithm for heap sort and sort the following data using heap sort showing each step clearly :

25, 57, 48, 37, 12, 92, 86, 33

(b) Write an algorithm for inserting a key into a B-tree. Show the result of inserting the following key into an empty B-tree.

order. 5

F, S, Q, K, C, L, H, T, V, W, M, R, N, P, A, B, X,

Y, D, Z, E, G, I

Q. 7. Write short note on any two of the following :

(a) Radix sort

(b) B+ tree

(c) Tower of Hanoi problem

(d) Warshal algorithm