

Course :B.Tech.

Branch : EEE

Year/Semester : III/II

Academic Year : 2018-19

Subject :Data Structures Through C++ Admitted Batch : 2016

QUESTION BANK**UNIT - I**

1. a) Explain Class, Data Abstraction and Encapsulation in C++. 5 M
b) Explain about Abstract Data Type and Inheritance in C++. 5 M
2. a) Explain the procedure of Declaring Class Objects in C++. 5 M
b) Explain how to invoke Member Functions with example. 5 M
3. a) Explain about Polynomial and its Representation. 5 M
b) Write a C++ function to Add two Polynomials. 5 M
4. a) Explain about Sparse Matrix and its Representation. 5 M
b) Explain briefly about Special Class Operations. 5 M
5. a) Write a C++ function to Multiply the given Two Matrices. 5 M
b) Write a C++ function to display the Transpose of a given Matrix. 5 M

UNIT - II

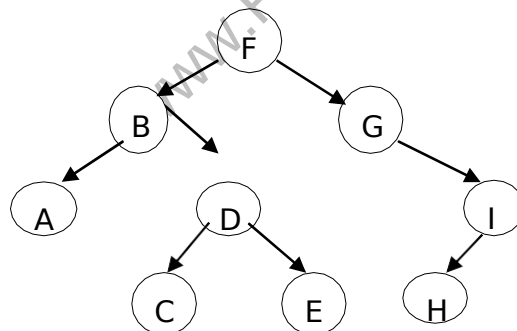
1. a) Explain about Stack ADT, PUSH and POP Operations. 5 M
b) Write C++ functions to implement PUSH and POP Stack Operations. 5 M
 2. a) Explain about Queue ADT, INSERT and DELETE Operations. 5 M
b) Write C++ functions to implement INSERT and DELETE Queue Operations. 5 M
 3. a) Explain about Circular Queues Operations. 5 M
b) Explain representation of Infix, Prefix and Postfix notations. 5 M
 4. a) Explain about Inheritance in C++ with example. 5 M
b) Convert the Infix Expression $(a+b)*c/d+(e+f)$ into Postfix using Stacks. 5 M
 5. a) Evaluate the Postfix Expression: $6\ 2\ 3\ +\ -\ 3\ 8\ 2\ /\ +\ *\ 2\ 3\ /\ +$ 5 M
b) Explain about Template Functions and Template Classes in C++ with examples. 5 M
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UNIT - III

1. a) What is a Single Linked List? Explain its representation. 3 M
b) Write a C++ Program to Create and Display the given Single Linked List. 7 M
2. a) Explain Stack operations using Linked Lists. 3 M
b) Write a C++ Program to implement Stack Operations using SLL. 7 M
3. a) Explain Queue operations using Linked Lists. 3 M
b) Write a C++ Program to implement Queue Operations using SLL. 7 M
4. a) What is a Double Linked List? Explain its representation. 3 M
b) Write a C++ Program to Create and Display the given Double Linked List. 7 M
5. a) Explain different cases of Insert operations on a single linked list. 3 M
b) Write C++ functions to Insert a New Node at First Place, Last Place and at any given position in a Single Linked List. 7 M

UNIT - IV

1. a) Construct the binary tree from the following: Pre-order: 1, 2, 4, 8, 9, 10, 11, 5, 3, 6, 7
In-order: 8, 4, 10, 9, 11, 2, 5, 1, 6, 3, 7 5 M
b) What is a binary tree? Construct a binary tree from the following: Pre-Order Traversal: G B Q A C K F P D E R H
In-Order Traversal: Q B K C F A G P E D H R 5 M
2. a) Find In order, Pre order and Post order traversals of the given binary tree: 5 M



- b) Discuss about different binary tree traversals with examples. 5 M
3. a) Write short notes on Threaded Binary trees. 5 M
b) Explain various methods in which a Binary Tree can be represented. Discuss their advantages and disadvantages. 5 M

4. a) With the help of diagrams construct a Binary Search Tree (BST) with the following keys: 23,12,45,36,5,15,39,2,19.
Also delete 42 from BST.

5 M

- b) Write a C++ Program to Create and Display a Binary Search Tree.

5 M

5. a) Write a C++ Program to Create and Display a Binary Tree.

5 M

- b) Draw a Max Heap Tree with the following values: 20,12,14,3,52,15,139,27,190

5 M

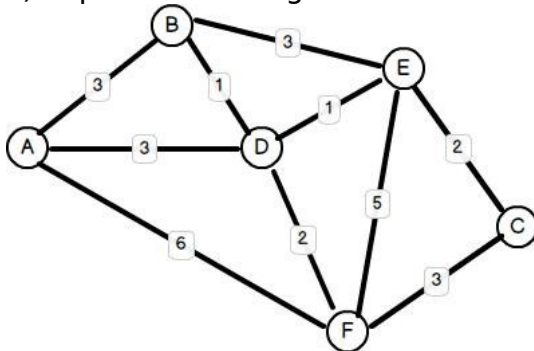
UNIT - V

1. a) What are different ways of representing a graph? Explain with example.

5 M

- b) Explain Prim's algorithm with the following Graph:

5 M

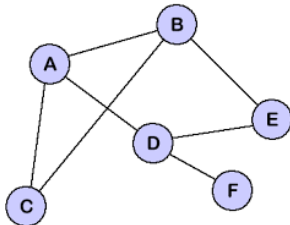


2. a) Write a C++ Program to Traverse the given Graph using Depth First Search.

5 M

- b) Explain DFS. Print DFS Order and DFS Tree for the following Graph:

5 M

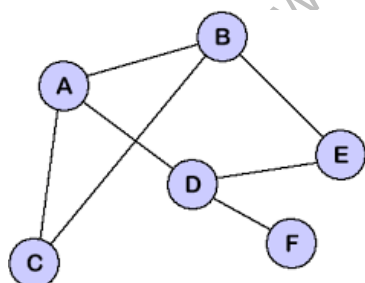


3. a) Write a C++ Program to Traverse the given Graph using Breadth First Search.

5 M

- b) Explain BFS. Print BFS Order and BFS Tree for the following Graph:

5 M

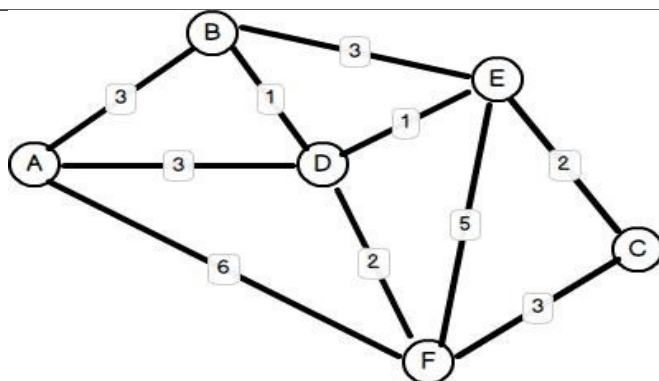


4. a) Explain Kruskal's Algorithm to find the Minimum Cost Spanning Tree.

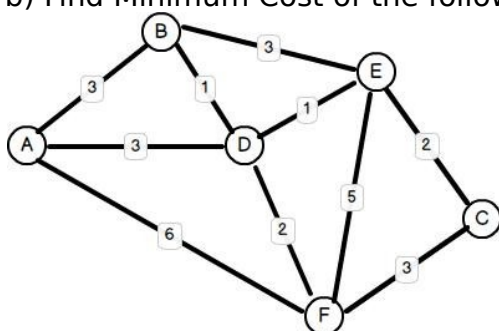
5 M

- b) Find Minimum Cost of the following Graph using Kruskal's Algorithm:

5 M



5. a) Explain Sollin's Algorithm to find the Minimum Cost Spanning Tree. 5 M
b) Find Minimum Cost of the following Graph using Sollin's Algorithm: 5 M



UNIT - VI

1. a) Explain and Write an algorithm for Merge Sort. 5 M
b) Sort the elements using Merge Sort: 12,25,5,9,1,84,63,7,15,4,3 5 M
2. a) Explain and Write an algorithm for Quick Sort. 5 M
b) Sort the elements using Quick Sort: 66,5,45,36,65,15,39,66,56,55 5 M
3. a) Explain and Write an algorithm for Insertion Sort. 5 M
b) Sort the elements using Insertion Sort: 65,6,54,63,56,61,14,39,28,16,30 5 M
4. a) Explain Heap Sort Technique. 5 M
b) Write a C++ Program to Sort the given vales using Heap Sort/Tree. 5 M
5. a) Write a C++ Program to Sort the given values using Quick Sort. 5 M
b) Write a C++ Program to Sort the given values using Insertion Sort. 5 M

Signature of Faculty