V.V.M'S Shree Damodar College of Commerce & Economics, Margao-Goa

F.Y.B.C.A, SEM II, END SEMESTER EXAMINATION, APRIL 2016

DATA STRUCTURES, BCA-201

Duration: 2 Hours **Total Marks: 50**

Instructions: **1) All Questions are Compulsory.**

2) Figures to the right indicate Full Marks.

3) Write Every Question on Fresh page.

Q1] Answer the Following draw diagrams wherever required (2mks x 5 =10 mks)

a) Explain the difference between Max Heap Tree and Min Heap tree.

b) Explain Why Circular Queues preferred over Simple Queues?

c) Give Preorder Traversal and Postorder Traversal for tree structure given below in fig a.

d) Explain the terms: Depth of Tree, Degree of a node

e)Explain Tree Representation of the tree structure given below using Arrays.

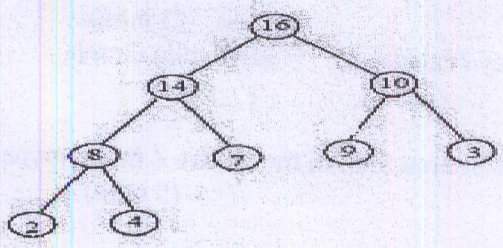


Fig a

Q2] Answer the Following.

a) Explain effectiveness of Binary Search technique? **(2mks)**

b) Write the Algorithm of Insertion Sort. **(3 mks)**

c) For given input data Set explain how Selection Sort will operate? **(5 mks)**
Data set: 100, 7, 90, 4, 25, 89

Q3] Answer the Following

a) Explain how you can differentiate Singly Linked List from Doubly Linked List. **(2mks)**

b) Stack implementation using Linked List is preferred over Array Implementation Explain. **(3 mks)**

c) Write algorithm to implement Dequeue Operation and Enqueue Operation using Linked List? **(5 mks)**

Q4] Answer the Following

a) What is an Expression tree ?For the given expression draw Expression tree. **(2mks)**

(a+b) * (d/y) + m – r

b) Construct Binary Search tree for the given inputs **(3 mks)**

20, 4, 33,1, 12, 78, 25, 60, 90

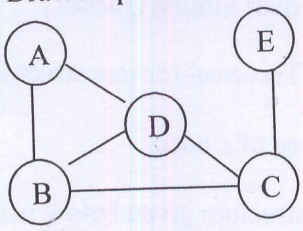
Specify which type is the above drawn BST and why?

c) Perform Sorting on data set given below using maximum heap tree. **(5 mks)**

Data Set : 25,1,44,10,90, 86

Q5] Answer the Following

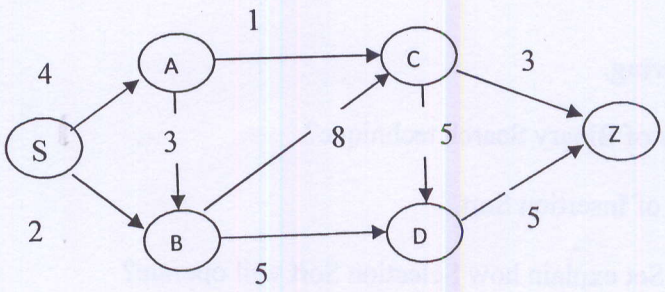
a) What is a Spanning Tree? Draw Depth First Search Spanning tree. **(2mks)**



b) Explain the following terms: **(3 mks)**

i) Unweighted Graph ii) Adjacency Matrix iii) Cyclic Graph

c) For the given graph find the shortest path from Source S to all the Nodes Z in the given figure below using Dijkstra's Algorithm. **(5 mks)**



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