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

F.Y.B.C.A, SEM II, May/June Supplementary Examination 2018

DATA STRUCTURES , BCA-201

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

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

2) Figures to the right indicate Full Marks.

Q.1 Answer the following in one or two lines **(2X5=10 mks)**

a) How circular linked list overcomes the problems of singly linked list ?

b) Give four applications of stack data structure.

c) What is a complete binary tree ? Give appropriate example .

d) What Is an Expression Tree. Draw the expression tree for the given expression.

A* (B * C) / (D + F)

e) State any four limitations of an array .

Q2) Answer the following. **10 mks**

i) Given arr1:4 20 28 99 120 and arr2 : 3 10 25 80 (2 mks)

Sort the above two arrays using Merge sort .List the steps involved .

ii) Write the algorithm to Push an element in the stack (use array) (3 mks)

iii)Use the most efficient Searching method to search a value 30 in the list (5 mks)

2, 8, 12, 25, 33, 42, 67, 92, 100. List the steps involved in the search operation .

Q3) Answer the following.

i) What is Doubly Linked list ? What are the advantages of using doubly linked list over singly linked list (2 mks)

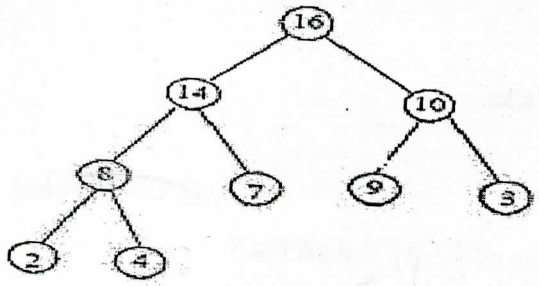
ii) Write the algorithm to perform dequeue operation on queue (use linked list)? (3 mks)

iii) List five advantages of using Linked List over Arrays.? (5 mks)

Q4)Answer the following.

i) Data : 5,8,7,3,10,2,20,6. Perform Pre-order traversal of tree on the given data . (2mks)

ii) For a given tree structure as shown below, perform the following (3 mks)
a) post-order traversal b) check if the tree is Complete Binary tree. Justify your answers.
c) Check if the tree is Binary Search Tree. Justify your answers.



iii) Explain Heap Sort on following data set
28 , 30 , 10 , 8 , 20 , 40 ,15

(5 mks)

Q5)Answer the following.

i) Convert the expression (A+B*C) / (D/E*F)*G + H , into prefix notation (2 mks)
ii) What is a Spanning Tree of a Graph? Draw Spanning trees for the graph shown in **Fig i** below. (3 mks)

iii) Explain Breadth-First Search traversal on the graph given below showing all steps. Consider A as starting point. (5 mks)

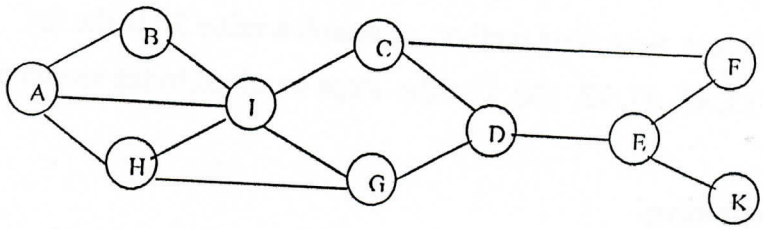


Fig i

********** ALL THE BEST **********