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J-3767[UP-7021] [2037]

BCA (Semester - 2nd)

DATA STRUCTURES (BCA - 204)

Time : 03 Hours **Maximum Marks : 75**

Instruction to Candidates:

1) Section - A is **compulsory**.

2) Attempt any **Nine** questions from Section - B.

Section - A

Q1) ***(15 x 2 = 30)***

a) What is a stack? What are the operations performed on stack?

b) Write the various procedures of Tree traversal?

c) What is the difference between local variables and global variables?

d) What is garbage collection?

e) What is the difference between data and information?

f) Convert the following infix expressions into postfix expressions

i) (A-B)*(D/E)

ii) (A+B↑D)/(E-F)+G

g) What is the difference between a linklist and an array?

h) The following eight numbers are inserted in order into an empty binary search tree T: 50, 33, 44, 22, 77, 35, 60, 40. Draw the tree T.

i) What is the difference between searching and sorting?

j) List the various operations performed on data structure?

k) What are the complexities of

i) Insertions sort

ii) Merge sort

l) Define Data Structure? What are the different types of data structure?

m) Define complete binary tree?

n) Define the big O notation?

o) What are the advantages of doubly linklist?

Section - B

(9 x 5 = 45)

Q2) Write the procedure to insert an item at the end of a linklist?

Q3) Write the procedure to push and pop element in stack?

Q4) Convert the following infix expression into postfix expression showing the stack contents

A+(B*C-(D/E F)*G)*H

Q5) Explain the two way list? List the various operations performed on two way list?

Q6) Explain the difference between quick sort and heap sort?

Q7) Discuss the applications of Tree?

Q8) Write the procedure to insert an item ↑ in a queue?

Q9) What is the difference between binary search tree and heap? Build a heap H from the following data

44, 30, 50, 22, 60, 55, 77, 55

Show diagram of each insertion?

Q10) What do you mean by complexity of an algorithm? Explain the time space trade off with suitable example?

Q11) Write the procedure for binary search? What are the limitations of binary search?

Q12) What is bubble sort technique? Apply this on the following list of numbers

44, 33, 11, 55, 77, 90, 40

Q13) Discuss the various representations of tree in memory? Explain the merits and demerits of each?

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