

Roll No.

Total No. of Questions : 13]

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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) $(A+B \uparrow D)/(E-F)+G$
- 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?

P.T.O.

- 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?
