

Please check whether you have got the right question paper.

- N.B:
1. All questions are compulsory.
 2. Figures to the right indicate marks.
 3. Illustrations, in-depth answers and diagrams will be appreciated.
 4. Mixing of sub-questions is not allowed

Q.1 Attempt all (each of 5 marks)

15

- a) Select appropriate choice from the following.
 - i) Stack ADT can be easily implemented by using python:
 - a) Tuple
 - b) List
 - c) Dictionary
 - d) All a, b & c
 - ii) The common name of function n^2 is
 - a) Linear
 - b) Quadratic
 - c) Exponential
 - d) None of these
 - iii) The maximum swap operations are involved in
 - a) Insertion sort
 - b) Bubble sort
 - c) Selection sort
 - d) Both b & c
 - iv) Doubly linked list consist of:
 - a) 2 data items & one address reference.
 - b) 1 address reference & one data item.
 - c) 2 address references & one data item.
 - d) None of these.
 - v) The binary tree must have.
 - a) Every node with 2 siblings
 - b) Every node with at least 1 sibling
 - c) Every node with at the most 2 siblings
- b) Fill in the blanks.
 - 1) In post order traversal root node is visited _____.
 - 2) The `dims ()` method returns _____ of multidimensional array.
 - 3) The entry/exit point of stack is called _____.
 - 4) The _____ method returns the iterator object.
 - 5) The size of tree is simply _____ in tree
- c) Short answers.
 - 1) Define set ADT.
 - 2) As a time efficiency which sorting algorithm is best for python list?
 - 3) Define algorithm.

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- 4) Define recursive Function?
- 5) Draw expression tree for expression $(9+5)*(12-6)$

Q.2 Attempt the following (Any Three)

15

- a) Write a short note on abstract data type.
- b) Sort the given list of numbers using insertion sort. Show step by step procedure 14, 33,27,57,100,12.
- c) Explain different operations on set in python with example.
- d) Discuss the cases of algorithm.
- e) Write a program to accept one name from user & display whether that name exist in predefined name list.
- f) Explain the applications of array ADT.

Q.3 Attempt the following (Any Three)

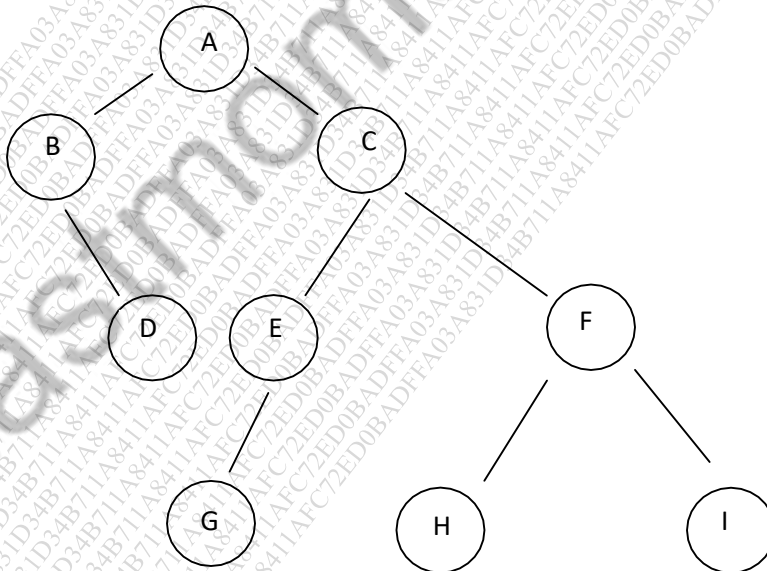
15

- a) What is linked list? List & explain types of linked list.
- b) Convert the following infix expression into postfix.
 - i) $(a+b*c)-d$
 - ii) $(-a+b)-25/5*3+4$
 - iii) $(a/b*c)-56+12^2$
- c) How priority queue is implemented?
- d) Define function to put node at the end of the linked list.
- e) Explain stack data structure with its application.
- f) Define pop function for stack ADT implemented using python list.

Q.4 Attempt the following (Any Three)

15

- a) Write a python code to find factorial of a number using recursive function.
- b) What do you mean by hashing linear probing?
- c) For a given binary tree perform inorder preorder & post order traversal.



P.T.O

- d) What is tail recursion? Give example.
- e) Write in brief about hash function.
- f) State & explain properties of tree.

Q.5 Attempt the following (Any Three)

15

- a) Write a program to get 10 numbers from user. Then search -5 exists in this number list.
 - b) Explain operations performed on queue ADT.
 - c) Write a note on runtime stack.
 - d) Suppose 'Q' is empty queue. After performing each of the following operation what will be the status of Q.
 - i) Q. enqueue (10)
 - ii) Q. enqueue (200)
 - iii) Q. isempty ()
 - iv) Q. dequeue ()
 - v) Q. dequeue ()
 - e) Explain post order traversal with example.
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