

Q.P. Code :04510

[Time: 2 $\frac{1}{2}$ Hours]

[Marks:75]

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 & diagrams will be appreciated.
 4. Mixing of sub questions is not allowed.



15

Q.1 Attempt all (each of 5 marks)

- a) Select appropriate choice from the following.
- i) Array in python is:
 - a) Data type
 - b) Advanced data type
 - c) Abstract data type
 - d) None of these
 - ii) Stack is also known as:
 - a) FIFO Structure
 - b) LIFO Structure
 - c) Both a & b
 - d) None of these
 - iii) Singly linked list allows traversal in.
 - a) Forward direction
 - b) Back ward direction
 - c) Both a & b
 - d) None of these
 - iv) The method which removes last element from python list is
 - a) Delete ()
 - b) Remove ()
 - c) Pop ()
 - d) All a, b, & c
 - v) The set operation which performs finding common between 2 sets is.
 - a) Union
 - b) Intersection
 - c) Subset
 - d) Superset
- b) Fill in the blanks.
- i) Full form of ADT is _____
 - ii) The entry point queue is called _____ & exit is called as _____.
 - iii) The function which calls itself is _____ function.
 - iv) When last node of linked list point to first node, the list is called as _____.
 - v) The depth of tree is simply number of _____ in tree.

P.T.O

10

Q.P. Code :04510

c) Short answers.

- i) Define data structure.
- ii) State the factors used for algorithm analysis.
- iii) Which ADT is used in solving polynomial expressions?
- iv) Define tree.
- v) Define Hashing.

Q.2 Attempt the following (Any Three)

15

- a) What is ADT? Discuss its advantages.
- b) Write a program to read 10 numbers & then search whether 55 exist in that list.
- c) Suppose set is implemented by using python list, define is subset (set B) method to decide whether B is subset.
- d) How array differs from python list?
- e) Write note on Algorithm analysis.
- f) Explain binary search technique with example.

Q.3 Attempt the following (Any Three)

15

- a) Explain prepending operation on singly linked list.
- b) Consider stack 'STK' is empty. After performing each of the following operation, draw the status of 'STK' with its contents & Top position.
 - i) STK. push (100)
 - ii) STK. push (150)
 - iii) STK. pop ()
 - iv) STK. pop ()
 - v) STK. push (200)
- c) Write a program to implement queue using python list.
- d) Explain the concept of doubly linked list with example.
- e) Define node for singly linked list & define function to traverse list.
- f) Explain why on should use linked list when list in python is available?

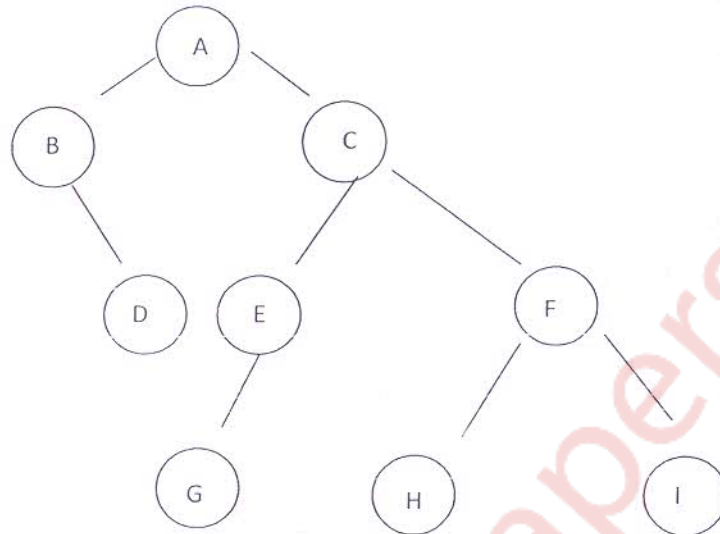
Q.4 Attempt the following (Any Three)

15

- a) Explain working of recursive operation.
- b) Write a note on hash unction.
- c) Explain the procedure of merge sort.

P.T.O

d) With respect to given tree diagram answer following.



- i) List path from A to H
- ii) What is the postorder traversal of tree
- iii) List all interior nodes
- iv) List all leaf nodes
- v) Is it binary tree? Why?
- e) How to construct expression tree? Give example.
- f) Explain inorder traversal with proper tree diagram.

Q.5 Attempt the following (Any Three)

15

- a) explain efficiency analysis for operations on list such as append & extend.
- b) Write a program to read 5 names & display them in alphabetic order.
- c) Convert following expression into postfix form.
 - i) $(X*Y)/Z$
 - ii) $A + B * (C-D)/E$
 - iii) $H/i*j-k+m$
- d) What is iterator? Explain its use.
- e) State & explain properties of tree.
