

313306

24225

3 Hours / 70 Marks

Seat No. 

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- Instructions* – (1) All Questions are *Compulsory*.  
(2) Answer each next main Question on a new page.  
(3) Illustrate your answers with neat sketches wherever necessary.  
(4) Figures to the right indicate full marks.  
(5) Assume suitable data, if necessary.  
(6) Use of Non-programmable Electronic Pocket Calculator is permissible.  
(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

1. **Attempt any FIVE of the following :** **10**
- a) List features of python.
  - b) Differentiate between lists, tuples, sets and dictionary in python.
  - c) Write steps to create python package with suitable example.
  - d) Define object oriented programming and state its features.
  - e) Give two examples each of Linear Data Structure and Non-linear Data Structure.
  - f) State the definition of following terminologies of trees :-
    - internal node
    - degree of tree
    - level of tree
    - height of tree

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2. **Attempt any THREE of the following :** **12**
- a) Define datatypes and list all the python datatypes with example.
  - b) State functions in python. Write an example of any two built in functions in python.
  - c) List four methods used in Numpy library.
  - d) Differentiate between data abstraction and data encapsulation.
3. **Attempt any THREE of the following :** **12**
- a) Write a python program to create a user-defined functions for performing basic arithmetic operations like :
    - addition
    - subtraction
    - multiplication
    - division
  - b) Differentiate between module and package in python.
  - c) Convert the following infix expression to prefix :-  
$$A * B + C / D$$
$$(A - B / C) * (A / K - L)$$
  - d) List any four properties of spanning tree.
4. **Attempt any THREE of the following :** **12**
- a) Write a python program to print fibonacci series for five terms.
  - b) List any four applications of trees.
  - c) Write a python program to create dictionary for names of all programming languages.
  - d) Write a python program to implement multiple inheritance.
  - e) Write a python program for implementing recursive binary search.

**5. Attempt any TWO of the following :****12**

- a) Write a python program to implement method overloading and method overriding.
- b) Define arrays. Write a python program to create a two dimensional array of integer numbers and access the values at the given index.
- c) Create a BST for following values :-  
45, 15, 79, 90, 10, 55, 12, 20, 50 with stepwise explanation.

**6. Attempt any TWO of the following :****12**

- a) Define following terms with one example of each in python.
    - identifiers
    - keywords
    - indentation
    - variables
    - tuples
    - comments
  - b) Perform following operations on set
    - i) Accessing values in set
    - ii) Deleting values in set
    - iii) Updating values in set
  - c) Distinguish between Breadth First search and Depth First Search.
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