

22395

12425

03 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 answer 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 any two object oriented features supported by Python.
  - b) Differentiate between tuple and list. (Any two points)
  - c) List any two Python packages.
  - d) Define terms:
    - i) Class
    - ii) Object
  - e) State any two types of searching techniques.
  - f) Define the terms:
    - i) Tree
    - ii) Graph.
  - g) Define the terms:
    - i) Queue
    - ii) Linked list.

P.T.O.

**2. Attempt any FOUR of the following:****12**

- a) Explain directed graph with example.
- b) Develop a program for linear search
- c) Write a program to print the following pattern:

1

1 2

1 2 3

1 2 3 4

- d) Describe any three methods of lists in Python.
- e) State any three features of Pandas.

**3. Attempt any FOUR of the following:****12**

- a) Write a program to create dictionary of students that includes roll - no. and name:
  - i) Add three students in above dictionary.
  - ii) Delete information of roll-no = 1.
- b) Explain binary trees with suitable example.
- c) Write a Python program to print factorial of a given number using for loop.
- d) What is the array? Explain its types with example.
- e) Describe data structures in Python.

**4. Attempt any THREE of the following:****12**

- a) Write a Python program to implement queues.
- b) Explain four tree terminologies with example.
- c) Explain an four built in functions of Numpy with example.
- d) Develop a program for single inheritance.
- e) Describe set operations in Python with example.

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

- a) Develop Python program for binary search.
- b) Write a Python program to calculate area of rectangle and area of square using method overloading.
- c) Explain pre-order, post-order and in-order tree traversing with example.
- d) Write a Python program to display 1 to 5 numbers using while loop.
- e) Explain Modules in Python with an example.

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

- a) Explain two methods of each:
    - i) Numpy
    - ii) Pandas
    - iii) Matplotlib.
  - b) Develop a program to create a singly linked list with 3 nodes.
  - c) Write the output of the following:
    - i) 

```
>>> a = [2, 5, 1, 3, 6, 9, 7]
>>> a [2:6] = [2, 4, 9, 0]
>>> print(a)
```
    - ii) 

```
>>> b = ["Hello", "Good"]
>>> b. append ("Data Structure")
>>> print (b)
```
    - iii) 

```
>>> t1 = [3, 5, 6, 8]
>>> print (t1[2])
>>> print (t1[-1])
>>> print (t1[2:])
>>> print (t1[:])
```
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