

Name of the Course : **B.Sc. Prog./Mathematical Sc**
Semester : **I**
Name of the paper : **Problem Solving Using Computer**
Unique Paper Code : **42341102**
Duration: 3 Hours **Maximum Marks: 75**

Instructions for Candidates:

1. All questions carry equal marks.
2. Attempt any four questions.

Q1 What are the different built_in data types in Python? Specify any five.

What are the basic characteristics of an Object Oriented Language? Mention any four and elaborate any one giving suitable examples.

Consider the following code:

```
class A(object):
    def go(self):
        print("go A go!")
    def stop(self):
        print("stop A stop!")
```

```
class B(A):
    def go(self):
        super(B,self).go()
        print("go B go!")
```

```
a = A()
b = B()
```

Specify the output of the following statements:

- b.go()
- b.stop()

Q2 Write two differences between lists and tuples in Python.

What is the output of the following statements :

- str = "Friendship"
print str[2:5]

- `lst = ['abcd', 15,10.11,'Rachel',7.77]`
`print lst[1:3]`

Let x be an integer and y be a string variable. Initialize x = 4, y = '24'. Write code to print the arithmetic sum of x and y (for example, in this case 28 would be printed).

Q3 What is a recursive function? Taking n as an input from the user, write a program in Python to print the nth term of Fibonacci Series using

- Iteration
- Recursion

Consider the following statements:

```
a = 10
b = a
```

What is the difference between `a == b` and `a is b`?

Q4 Write a program in Python to implement Selection sort on a given list of numbers.

Apply Insertion sort on the following list. What would the list be after fourth iteration?
[4,10,0,9,2,1]

Name the string functions to perform the following :

- Checks if all characters in a string are digits
- Checks if all characters in a string are in lower case
- Replaces all occurrences of j with k

Q5 What are the prerequisites for searching a value in a list using Binary Search?

Write a Python program to implement Binary Search.

What will be the output of the following code:

```
i = 1
while True:
    if i%2 == 0:
        break
    print i
    i += 2
```

Q6 What is the significance of writing functions? Differentiate between local and global parameters giving suitable examples.

Write a function that takes a list as input and returns the square of the maximum value in the list. Write a program that calls this function and prints its output for the input list

lst[12,5,7,1,30,8].

What would be the output of the following functions:

- ```
def func1():
 try:
 return 1
 finally:
 return 2
k = func1()
print k
```

- ```
def func2():  
    a = 1  
    print a
```

```
a=123  
func2()  
print a
```