

Unique Paper Code : **32345104**
Name of the Paper : **Programming using Python**
Name of the Course : **Computer Science: Generic Elective for Honours**
Semester : **I**
Year of Admission : **2019 onwards**

Duration: **3 Hours**

Maximum Marks: **75**

Attempt any **four** questions.
All questions carry equal marks.

Question 1 • Give the output for the following Python code snippets and justify your answer:

```
➤ sum = 0
  for i in range (10, 0, -2):
      sum = sum + i
      print(i)
      if i == 4:
          continue
  print(sum)
```

```
➤ def func(b):
    global x
    print('Global x=', x)
    y = x + b
    x = 7
    z = x - b
    print('Local x = ', x)
    print('y = ', y)
    print('z = ', z)
x=5
func(10)
```

```
➤ List=[1,6,8,4,5]
  print(List[-4:])
```

```
➤ print("My" *3 + "Blog" +'7')
```

```
➤ dict1 = {"name": "Mike", "salary": 8000}
  temp = dict1.pop("age")
  print(temp)
```

- Write a Python function, with appropriate comments, to **reverse** each word of a sentence passed to it as a string parameter. For example,
Input : 'My Name is Jessa'
Output : 'yM emaN si asseJ'
- Write a Python function, with appropriate comments, that takes name and age of a person as input and displays an appropriate message whether the person is eligible to vote or not. Minimum age for voting being 18 years.

- Question 2
- Write a Python function with appropriate comments that takes an integer n as input to find the sum of the following series:

$$1*3/1! + 2*5/2! + 3*7/3! + \dots + n*(2n+1)/n!$$

Use appropriate assertions where needed.

- What will be the output of the following? Justify your answers.

- `'hello' * (5 - 2)`
- `5 % 10 + 10 - 25 * 8 / 5`
- `-15 & 22`
- `'bye' < 'Bye'`
- `8 << 3`

- For the following sets:

```
s = set(['a', 'b', 'c', 'd', 'e'])
```

```
v = set(['x', 'y', 'z'])
```

- What will be the output of the following? Justify your answers.

- `print('w' in v)`
- `u=s.union(v)`
`print(u)`
- `print(s.intersection(v))`
- `print(s.difference(v))`

- Write a Python function with appropriate comments, that takes a list of values as input parameter and returns a new list after removing the duplicate values in the original list. The function should also return the number of elements in the new list. For example,

Input to the function: [1,4, 6, 1, 3, 1, 6]

Values returned from the function: [1,4,6,3], 4

- Question 3
- Write a Python function with appropriate comments that takes an integer n as parameter and prints the following pattern. For example, for $n = 5$ it prints:

```
      *
     ***
    *****
   ***
  *
```

- For the given string:
`s1 = 'Programming is Fun!'`

What will be the output of the following? Justify your answer.

- `print(s1[:7])`
 - `print(s1.swapcase())`
 - `print(s1.count('i'))`
 - `print(s1.find('am'))`
 - `print(s1.replace('is', 'was'))`
 - `print(s1.split())`
- Write a Python function with appropriate comments that reads the contents of the file “Poem.txt” and prints the number of alphabets, blank spaces, lowercase letters and uppercase letters, the number of words starting with a vowel, and the number of occurrences of each word in the file.
 - Show the contents of the stack after every operation during evaluation of the postfix expression: $836+27-9+*/$

Question 4 • Write a Python function `searchKey(inList, key)` with appropriate comments for searching the key in the list of n integers `inList` using linear search. The function should return the index of the item if it is present in the list, otherwise, it should return -1. Write the statements to call `searchKey()` when `inList=[10,4,5,-7, 23]` and `key = -77`.

• For the given dictionary:

```
Grades = {"Sahil" : 90, "Abhijeet" : 65}
```

What will be the output of the following? Justify your answer.

- `print (Grades.keys())`
- `print (len(Grades))`
- `Grades["Kuruss"]=99`
`print (Grades)`
- `Grades["Abhijeet"]+=5`
`print (Grades)`
- `del Grades["Abhijeet"]`
`print (Grades)`
- `print (Grades.items())`

• Given the tuple:

```
t1 = (12, 5, 2, 4, 17, 6, 9, 10)
```

Write Python statements to:

- Print first half of the values of `t1` in one line and the other half in another line.
 - Display a list comprising all the even numbers in the tuple `t1`.
 - Concatenate a tuple `t2=(11, 13, 15)` with `t1`.
 - Return maximum and minimum value from `t1`.
 - Create a tuple `t3` with only one element 10 in it.
- Write one line Python code for:
- Swapping two numbers without using a third variable.
 - Generating the series 7, 14, 21..... 70 using the range function.
 - Finding the cube of first 5 natural numbers using list comprehension.

Question 5 • Consider a queue that is initially empty. It undergoes the following sequence of operations: enqueue(5), enqueue(10), dequeue, enqueue(20), enqueue(25), dequeue, dequeue, dequeue. Show the contents of the queue after each operation.

• A Fibonacci sequence is a sequence of integers: 0, 1, 1, 2, 3, 5, 8, ... where the first two terms are 0 and 1. All other terms are obtained by adding the preceding two terms. In other words, n^{th} term is the sum of $(n-1)^{\text{th}}$ and $(n-2)^{\text{th}}$ term. Define a Python function fibo, with appropriate comments, to display the Fibonacci sequence up to n terms where n is passed as parameter to the function.

• Given that:

```
list1 = [1, 2, 3]
list2 = ['a', 1, 'z', 26, 'd', 4]
```

What will be the output of the following? Justify your answer.

```
➤ print(list1 * 2)
➤ list2.extend(['e', 5])
  print(list2)
➤ del list1[1 : ]
  print(list1)
➤ list2.append(['e', 5])
  print(list2)
➤ list2.remove('z')
  print(list2)
```

• Identify the errors in the following code and rewrite the correct code:

```
➤ A = int(input("Enter any number:"))
  Ar = 0
  for x in range(0,A,2)
    Ar+=x
    if x%2=0:
      Print (x*10)
    Else:
      print (x)
  print(Ar)
```

```
➤ 10 = step
  for e in the range(0 , step):
    If e%2==0:
      print(e + 1)
    else:
      print(e - 1)
```

Question 6 Define a Python class `BankAccount` that keeps track of a bank's customers having the following data members:

`name`: Name of the customer

`accountNum`: Account Number (auto generated value, beginning at 1)

`balance`: Amount deposited in the Bank account

Keep an additional variable `count` to record the number of objects created for this class. Every time a new account is opened in the bank, the `count` is updated.

The class should support the following methods:

- `Deposit`: for depositing money in the account
- `Withdraw`: for withdrawing money from the account
- A method to display the total number of accounts in the bank.
- The `__str__` function to display the complete details of an object of the `BankAccount`.
- `findInterest`: to determine the interest on the basis of `balance` in the account and the interest rate applicable as per the table listed below:

Amount	Rate of Interest (%)
$\geq 3,00,000$	7
$\geq 1,00,000$ and $< 3,00,000$	5
$< 1,00,000$	3

Write statements to:

- Create an account for Ms ABC having a balance of Rs 2,50,000, and Mr PQR having a balance of Rs 3,50,000. Display the number of accounts in the bank.
- Ms ABC keeps this money with the bank for a year. Calculate the interest for Ms ABC. Also, after end of 1st year, she deposits the same amount in her account. Show the updated balance for her account.
- Mr PQR withdraws Rs 1,00,000 from the account. Display the updated balance for his account.