Unique Paper Code   **62347503**

Name of Course   **B.A. Programme**

Name of Paper   **Programming with Python (LOCF)**

Semester   **V**

Year of Admission: **2019**

Duration: **3 hours**   Maximum Marks: **75**

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

1.   Write a Python program to calculate and print roots root1 and root2 as defined in the formula below. The user has to provide a, b & c as input.

$$root1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$
$$root2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

Construct logical expressions for representing the following conditions:
   o   Percentage should be greater than 60 and less than 75
   o   Gender is female and Age is less than 30
   o   Length of string str1 is greater than 4

Write a nested if statement in Python to calculate the Commission depending on Sales as given below:

```
Sales >= 1000 then Commission=20% of Sales
Sales < 1000 and >= 700 then Commission = 15% of Sales
Sales < 700  and  >=500  then Commission = 10% of Sales
Sales < 500  and  >= 200 then Commission = 5% of Sales
Sales < 200 then Commission = 2% of Sales
```

2.   Differentiate between __init__ method and any other user defined class method.

      When a=18 and c=20, derive and discuss the result of a | c.

      Define a class Student, which has Rollno, marks1, marks2 and marks3 as the data members. Describe the following methods:
         o   Constructor to initialize the data members
         o   Average() method to return the average marks
         o   Percentage() method to return the percentage of marks, considering 300 as maximum marks

Create an object `stud1` of class `Student` with values "Hitesh", 89, 75, 80. Calculate the average and percentage of `stud1` and print them.

3. Write a Python program to calculate the sum of *n* terms of the following series, where *n* is taken as input from the user.

$1/3 + 1/3^2 + 1/3^3 + 1/3^4 + 1/3^5 +$ …………………..

Write a Python program which prints the prime numbers present in a list `List1` of integers:
`List1 = [13,34,55,67,21,3,89,200,51]`

Solve the following and write the step by step execution:

```
for i in range(1, 10,1):
        for j in range(i, 20, i):
                        if    (i+j < 10):
                                print (i+j)
                        else:
                                break
```

4. Write a Python function that takes a string as a parameter and returns a string with every successive repetitive character replaced with an asterick (*).
For example: 'balloonl' is returned as 'bal*o*n*'.

Given a list `L1=[20,10,80,40,90,60,70]`. Write one line Python commands for the following:
   o Sort the list `L1`in descending order
   o Remove element '90' from `L1`
   o Add the elements ["a", "b"] at the end of `L1`
   o Add element '30' at index 3 in `L1`

Write a program to create a dictionary named `password_lookup` that contains `username` as keys and `password` as the values, both `username` and `password` are of string type. The `username` and `password` will be entered by the user one by one, until user enters "exit" for the `username`.

5. Consider the two sets given below:

`Set1={"Oreo", "Kit Kat", "Perk", "Kinder_Joy", "Snickers"}`
`Set2={"Dark_Fantasy", "HidenSeek", "Bourborn", "Perk", "ParleG"}`

Write Python commands to perform the following:
   o Combine the elements of `Set1` and `Set2`
   o Find common elements of `Set1` and `Set2`
   o Find those elements which are present in `Set2`, but not in `Set1`
   o Add "Maska_Chaska" to `Set2`

o   Find elements which are present either in `Set1` or `Set2`

Given the recursive function below:

```
def sum(n):
    if (n==1):
        return(1)
    else:
        return(n + sum(n-1))
```

Explain the step-by-step execution of the function call `sum(5)`. What will be the output of `sum(5)`?

Write a Python program to print the numbers between 100 and 200 where the middle digit is an even number.

6.   Which is most appropriate data structure (lists, sets, tuples, strings, dictionary) for storing the following data:
o   Collection of names (names can be repeated)
o   Collection of mail ids
o   Collection of pairs Student and Department
o   Collection of 10 characters

Write a function `maximum(a, b)` to calculate largest of the two numbers. Use this function to find largest of three numbers.

Write a Python program to create a dictionary `Result` having data of 5 students in the form of key: value pairs as `Student_name: marks`, where `marks` is a list of marks obtained in 5 subjects. Print student name, marks in all subjects and sum of marks. Also, create another dictionary having key: value pairs as `Student_name: Sum_of_marks`, where `Sum_of_marks` is sum of `marks` of the `Student_name` corresponding to `Result` dictionary and display this dictionary.