M.Sc. Information Technology 1st Sem. (Batch 2021-23)

COMPUTATIONAL PROBLEM SOLVING
USING PYTHON
Paper—MIT-105

Time Allowed—3 Hours] [Maximum Marks—100

Note :— Attempt **FIVE** questions in all, selecting at least **ONE** question from each Section. The **fifth** question may be attempted from any Section. All questions carry equal marks.

SECTION—A

1. (a) What are the various data types available in python ? Also explain some unique features of python in detail. Explain various applications of python programming language.

   (b) Illustrate ***args** and ****kwargs** parameters in Python programming language with an example.

2. (a) Explain the Identifiers, Keywords, Statements, Expressions and Variables in Python programming language with examples. Explain the basic data types available in Python with examples.

   (b) Write Python program to perform a linear search for a given Key number in the list and report Success or Failure.

SECTION—B

3. (a) Define Control flow statement with an example. Explain list data type. How it differs from a string, Tuple and dictionary ?

   (b) Report the Value for sin(x) upto n terms using the series :

   $$\sin(x) = \frac{x}{1!} - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$ where x is in degrees.

4. (a) What are lists in python ? What is list slicing ? How will you iterate though a list ? How do lists differ from arrays in python ? Give an example.

   (b) Write Python program to sort numbers in a list in ascending order using Bubble Sort by passing the list as an argument to the function call.

SECTION—C

5. Discuss the flow of execution of a python function. Differentiate top down and bottom up approach of modular programming. Write a program to find a factorial of a number using function.

6. Discuss polymorphism as implemented in Python programming language with an example. Write Python Program to Create a Class Called as Complex and Implement_add_() Method to Add Two Complex Numbers. Display the result by overloading the + Operator.

SECTION—D

7. Write Python program to change the file extension from .txt to .csv of all the files (including from sub directories) for a given path. Also, Explain the need for Pickle module. Write Python program to save dictionary in Python Pickle.

8. Write Python program to write the data given below to a CSV file :

   Category, Winner, Film, Year

   Best Picture, Doug Mitchell and George Miller, Mad Max: Fury Road 2015

   Visual Effects, Richard Stammers, X-Men: Days of Future Past, 2014

   Best Picture, Martin Scorsese and Leonardo DiCaprio, The Wolf of Wall Street, 2013

   Music (Original Song), Adele Adkins and Paul Epworth, Skyfall from Skyfall, 2012.