

2025

M.Sc. 1st Semester Examination

APPLIED MATHEMATICS

Paper : MTME405A0/B0

Full Marks : 50

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

(Elective-I)

Paper : MTME405A0

[Programming in Python]

Group - A

Answer any *four* questions : 2×4=8

1. What is an exception? Explain with few examples.
[CO3]
2. How to create user defined exception in Python with an example.
[CO3]
3. What is the output of
print (tpl[1:3]) if tpl = ('abcd', 786, 2.23, 'john', 70.2)?
[CO3]

P.T.O.

(2)

4. What are the rules for writing an identifier? [CO1]
5. What is tuple? What is the difference between list and tuple? [CO3]
6. Explain about string slicing with examples. [CO3]

Group - B

Answer any *four* questions : $4 \times 4 = 16$

7. What is inheritance? Illustrate types of inheritance with Python code. [CO4]
8. Write a class with following criteria : [CO4]

Class name: Flower

Objects: lily, rose, hibiscus

Properties: price, color, smell

Methods: get(), display()

9. Write a small code to illustrate try and except statements in Python. [CO4]
10. Write a Python program to convert temperature Celsius to Fahrenheit. [CO2]
11. How a string is declared in Python? How to split strings and what function is used to perform that operation? $2+2$ [CO3]
12. Describe the syntax and semantics of any two loop structures provided by Python. $2+2$ [CO2]

(3)

Group - C

Answer any *two* questions : 8×2=16

13. What is the concept of a class in Python? Write a class in Python defining a constructor, a method for finding $n!$ and a method for displaying the value of $n!$.

2+6 [CO4]

14. What are the basic list operations that can be performed in Python? Explain three operations with its syntax and example.

2+2+2+2 [CO3]

15. Explain briefly constant, variables, expression and keywords available in Python.

2+2+2+2 [CO1]

16. (i) Explain the features of a dictionary.

(ii) What are the three types of import statement in Python? Explain.

(iii) Write a short note on assert function.

3+3+2 [CO3]

Internal Assessment : 10 marks

P.T.O.

(4)

(Elective-II)

Paper : MTME405B0

[Programming in C++]

Group - A

Answer any *four* questions : $2 \times 4 = 8$

1. What are the basic data types in C++? [CO1]
2. What are the differences between ++x and x++, where x is an integer variable? [CO1]
3. Write four features of an object oriented programming language. [CO3]
4. What are the differences between class and object?
5. How a pointer variable is defined, initialised, and accessed? [CO2]
6. What do you mean by a constructor and a destructor? [CO3]

Group - B

Answer any *four* questions : $4 \times 4 = 16$

7. Write a short note on inline function in C++? [CO1]
8. Define a class to store a complex number having public functions for addition, multiplication, and division of two objects. Also write a public function to display the object. [CO3]

9. Write program to read n numbers from a file, stores the same in an array, and print a sorted list in the same file. The array size should be allocated dynamically based on the input value of n from keyboard. [CO2]
10. Explain inheritance using an example. [CO3]
11. Give a brief descriptions on the different modes in handling files in C++. [CO4]
12. Write a program to read a sentence from the keyboard and count the number of characters in it. [CO2]

Group - C

Answer any *two* questions : $8 \times 2 = 16$

13. Write a program to define a class named matrix to store a two dimensional array and its size. Overload operator * for the multiplication of two objects. Use it to read two matrices from a file and find their product if exists. [CO3]
14. Write a program to define a class that can store a real vector and its size. Define a public function **sum** to sum the elements of the vector. Overload the same function to add two vectors. Define another public function to display the vector. [CO3]
15. How a two dimensional array can be defined dynamically? Use it to read n names from a file, sort
P.T.O.

(6)

the same, and store the sorted list in another file, where n is an input from keyboard. [CO4]

16. Write short notes on polymorphism and virtual functions. [CO3]

Internal Assessment : 10 marks
