

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 86
(For candidates admitted from the academic year 2025 – 2026)

B.Sc. DEGREE EXAMINATION, APRIL 2026
BRANCH I - MATHEMATICS
SECOND SEMESTER

COURSE : ELECTIVE
PAPER : PROGRAMMING IN PYTHON
SUBJECT CODE : 25MT/ME/PP22
TIME : 3 HOURS **MAX. MARKS: 100**

Q. No.	SECTION A (2 × 5 = 10) Answer ANY TWO questions	CO	KL
1.	List five reasons why we need to learn Python.	1	1
2.	Define Object-Oriented Programming. Mention its basic principles.	1	1
3.	What is meant by a matrix? Mention its uses.	1	1
Q. No.	SECTION B (2 × 5 = 10) Answer ANY TWO questions	CO	KL
4.	Write a Python program to print numbers from 10 to 15 using a while loop.	2	2
5.	Describe dictionary data structure and its operations.	2	2
6.	Give an example to perform multiple variable substitution using sympy.subs() in Python.	2	2
Q. No.	SECTION C (2 × 10 = 20) Answer ANY TWO questions	CO	KL
7.	Explain the if...else statement with its syntax and flow chart. Also develop a Python program to check whether the number entered by the user is odd or even.	3	3
8.	Classify the different types of polymorphism.	3	3
9.	Identify the error in the following program: import numpy as np M = np.array([[2, 0, 0], [4, 5, 0], [4, 3, 1]]): eigenvalues, eigenvectors = np.linalg.eig(A) A = np.array([[2, 1]; [1, -3]]) B = np.array([5, 7,])	3	3

	<pre>X = np.linalg.sol(A, B) import matplotlib.pyplot as plt x = np.linspace(-2, 2, 100) y = x ** 2 fig = plt.fig(figsize = (10; 5)) pt.plot(x; y) plt.show()</pre>		
Q. No.	SECTION D (2 × 20 = 40) Answer ANY TWO questions	CO	KL
10.	(i) Explain the Input and Output functions in Python with suitable examples. (ii) Discuss the purpose and usage of break, continue, and pass statements in Python. (11 + 9)	4	4
11.	(i) Discuss the process of calling a function in Python. Also explain how parameters are passed to a function with suitable syntax and examples. (ii) Explain how to access all elements of a list in Python. Also explain reverse indexing in lists with suitable examples. (10 + 10)	4	4
12.	(i) Describe the various ways to create vectors using NumPy. (ii) Discuss any two case studies in mathematical modeling using Python. (10 + 10)	4	4
Q. No.	SECTION E (2 × 10 = 20) Answer ANY TWO questions	CO	KL
13.	Discuss the different data types in Python.	5	5
14.	Discuss recursive functions and explain the process of recursion in Python. Write a Python program to find the factorial of a number using recursion.	5	5
15.	Explain how Python is used in real-world problems and industries with suitable illustrations.	5	5