

D

0300CST362052203

Pages: 4

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree Supplementary Examination May 2023 (2019 Scheme)



Course Code: CST362

Course Name: PROGRAMMING IN PYTHON

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 3 marks.*

Marks

- |    |   |     |
|----|---|-----|
| 1  | What is the output of the following Python code. Justify your answer.<br><br><code>x = 'abcd'</code><br><code>for i in range(len(x)):</code><br><code>    print(i)</code> | (3) |
| 2  | Write the syntax and semantics of the <i>multiway-if</i> statement.   | (3) |
| 3  | Explain the concepts namespace, scope, and lifetime in the case of Python programming language.   | (3) |
| 4  | What are mutable and immutable properties in the case of Python data structures? Give one example each for mutable and immutable data structures in Python.               | (3) |
| 5  | What are the attributes of a turtle object?   | (3) |
| 6  | What are the advantages of GUI based programs over terminal based programs.   | (3) |
| 7  | What is meant by abstraction mechanism in programming? Give one example abstraction mechanism in Python.  | (3) |
| 8  | Explain the terms accessors and mutators with regard to Python class definition.  | (3) |
| 9  | Write a Python code that checks to see, if a file with the given pathname exists on the disk, before attempting to open a file for input.                                 | (3) |
| 10 | What is Flask in Python? What are its basic components?   | (3) |

**PART B**

*Answer one full question from each module, each carries 14 marks.*

**Module I**

- |       |  |          |
|-------|--|----------|
| 11 a) | Write a Python program to find the roots of a quadratic equation, $ax^2 + bx + c = 0$ . Consider the cases of both real and imaginary roots. | 2<br>(7) |
|-------|--|----------|

- b) Write a Python program to check whether a number is Armstrong number or not. (7)

An Armstrong number is an n-digit number that is equal to the sum of the n<sup>th</sup> powers of its digits.

Examples:  $153 = 1^3 + 5^3 + 3^3$ ,  $1634 = 1^4 + 6^4 + 3^4 + 4^4$

**OR**

- 12 a) Write a Python program to display the sum of odd numbers between a programmer specified upper and lower limit. (7)

- b) (7)

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots$$

Given the value of x, write a Python program to evaluate the following series upto n terms:

### Module II

- 13 a) Write a Python program to implement Caesar cipher encryption and decryption on a string of lowercase letters. Take distance value and the string as input. (Hint: Caesar cipher encryption strategy replaces each character in the plaintext with the character that occurs a given distance away in the sequence. (7)

Encryption: Eg. input: 3, "invade", Eg. output: "lqydgh"

Decryption: Eg. input: 3, "lqydgh", Eg. output: "invade")

- b) Write a Python code segment that opens a file for input and prints the number of four-letter words in the file. (7)

**OR**

- 14 a) Write a Python program to create a set of functions that compute the mean, median and mode of a set of numbers. Each function should expect a list of numbers as an argument and return a single number. Each function should return 0 if the list is empty. Include a main function that tests the three functions with a given list. (7)

(Hint: Mean: Mean is the average value of a list of numbers.

Median: If the number of values in a list is odd, the median of the list is the value at the midpoint when the set of numbers is sorted; otherwise, the median is the average of the two values surrounding the midpoint.

Mode: The mode of a list of values is the value that occurs most frequently)

- b) Write a Python program to check whether a list contains a sublist. (7)

Eg. Input 1: my\_list = [3,4,5,2,7,8] , sub\_list = [2,7]

output 1: True

input 2: my\_list = [3,4,5,2,7,8] , sub\_list = [5,7]

output 2: False

### Module III

- 15 a) Write a Python program to draw a hexagon and to fill it with red colour. Explain the turtle methods used in it. (7)
- b) Write a python program to convert a colour image to black and white image. (7)  
Explain the image methods used in it.

### OR

- 16 a) Write a GUI-based program that allows the user to convert amount in Indian Rupees to amount in Euro. (10)  
The interface should have labeled entry fields for these two values. These components should be arranged in a grid where the labels occupy the first row and the corresponding fields occupy the second row.  
At start-up, the Rupees field should contain 0.0, and the Euro field should contain 0.0. The third row in the window contains two command buttons, labeled R->E and E->R. When the user presses the first button, the program should use the data in the Rupee field to compute the amount in Euro, which should then be output to the Euro field. The second button should perform the inverse function.
- b) What are the attributes of a window? How the attribute's value can be changed? (4)

### Module IV

- 17 a) Write a Python program to define a class Rectangle with parameters height, width and member functions to find area, and perimeter of it. (7)
- b) Illustrate how inheritance and polymorphism can be implemented in Python. (7)

### OR

- 18 a) Create a Student class and initialize it with name and roll number. (7)  
Make methods to :  
1. Display - Display all informations of the student.  
2. setAge - Assign age to student  
3. setTestMarks - Assign marks of a test to the student.
- b) What are exceptions? How does Python catch it? Illustrate the usage. (7)



## Module V

- 19 a) Consider the following two-dimensional array named *arr2d* (8)

[[1, 2, 3],

[4, 5, 6],

[7, 8, 9]]

Write the output of following Python Numpy expressions:

1. `arr2d[:2]`

2. `arr2d[:2, 1:]`

3. `arr2d[1, :2]`

4. `arr2d[:2, 1:] = 0`

- b) Write Python program to write the following University topper data of CSE branch to a CSV file. (6)

Reg. No.	Name	Semester	College	CGPA
ABC123	Ganesh Kumar	S8	ABC	9.8
ECH265	John Mathew	S7	ECH	9.9
FET345	Reena K	S6	FET	9.7
GMT734	Adil M	S5	GMT	9.75

## OR

- 20 a) Write a Pandas program to read a CSV file named 'Diamond.csv' with fields *carat, cut, color, clarity, depth, and price* and to print the following: (4)

1. Number of rows and columns

2. First five rows

- b) Temperature(°C) on different dates is stored in a CSV file as (10)
- 'Weather\_data.csv' with the fields *date, temperature* and *humidity*.

1. Draw a plot of the weather report with date as the x-axis and temperature as the y-axis.

2. Draw a scatter plot of the weather report with date as the x-axis and humidity as the y-axis.

Give appropriate titles and labels in the plot.

\*\*\*\*