Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S,FE) (FT/WP) (S4 PT) Examination December 2025 (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 Evaluate the following Python expressions and write the result: (3)

a) 2**3**2

b) round(83.37)

c) chr(ord('A') + 3)

2 Write a Python program to count the positive and negative numbers in a given set of numbers. (3)

3 What is meant by abstraction? How does Python's function serve as abstraction mechanisms? (3)

4 Assume that the variable *mydata* refers to the list [5, 3, 7] . Write the values of the following expressions: (3)

a) *mydata*[0:2]

b) *mydata*[-1]

c) tuple(*mydata*)

5 What is turtle graphics? Write any two turtle methods. (3)

6 Write a GUI program to display the label "Welcome" on the window. Explain the methods used. (3)

7 Write the syntax of Python class definition and object creation. What is the role of __init__() method ? (3)

8 What is inheritance ? How can you inherit from a super class in Python? (3)

9 Explain the following functions from os module (3)

getcwd() listdir() walk()

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) Given the income amount, write a Python program to compute the income tax as per following tax rules: (7)

1. If the income amount <= Rs. 2,50,000 then zero tax.

2. If the income amount <= Rs. 5,00,000 then tax is 5% of the amount exceeding Rs. 2,50,000

3. If the income amount <= Rs. 10,00,000 then tax is Rs. 12500 + 10% of the amount exceeding Rs. 5,00,000

4. If the income amount > Rs. 10,00,000 then tax is Rs. 62500 + 20% of total income exceeding Rs. 10,00,000

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

OR

12 a) Write a Python program to compute the Highest Common Factor(HCF) of two numbers. (7)

b) Given the value of x, write a Python program to evaluate the following series upto n terms. (7)

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \cdots$$

Module II

13 a) Write a Python program that takes your full name as input and displays the abbreviations of the first and middle names followed by the last name which is displayed as it is. For example, if your name is Rani Bennet Rose, then the output should be R.B.Rose. (7)

b) Assume that a file contains integers separated by newlines. Write a Python code segment that opens the file and prints the average value of the integers. (7)

OR

14 a) The factorial of a positive integer n , fact(n) , is defined as follows: (7)

fact(n) = 1, when n = 1

fact(n) = n * fact(n - 1) , otherwise.

Write a Python program using function to find the factorial of a given positive integer. Also write another program using a recursive function fact, that returns the factorial of a given positive integer.

b) Assume that the variable *my_data* refers to the dictionary {'b':20, 'a':35} . Write the expressions that perform the following tasks: (7)

1. Replace the value at the key 'b' in *my_data* with that value's negation.
2. Add the key/value pair 'c':40 to *my_data* .
3. Remove the value at key 'b' in *my_data* , safely.
4. Print the keys in *my_data* in alphabetical order.
5. Print a list of tuples containing the keys and values for each entry in *my_data*.

Module III

15 a) Write a Python program to draw a rectangle and fill it with blue colour. Explain the turtle methods used in it. (7)

b) Write a python program to convert a colour image to gray scale image. Explain the image methods used in it. The relative luminance proportions of green, red, and blue are .587, .299, and .114, respectively. (7)

OR

16 a) Write a GUI-based program that allows the user to take an input integer from a field, compute the square root of this value, and output the result, rounded to two decimal places, to a second field. (10)

The interface should have labeled entry fields for input and output. These components should be arranged in a grid where the input label and entry field occupy the first row and the output label and entry field occupy the second row. If the data entered is not an integer or a negative number, the program should pop up a message box with the appropriate error message.

b) What is entry field in Python GUI ? How it can be used for input and output? (4)

Module IV

17 a) Write a Python class named Circle constructed by a radius and two methods which will compute the area and the perimeter of a circle. (7)

b) What is operator overloading? Illustrate it by creating a ComplexNumber class and adding a method for complex number addition by overloading the "+" operator. (7)

OR

18 a) Create a Time class and initialize it with hours and minutes. (10)

1. Make a method addTime which should take two time object and add them.

E.g.- (2 hour and 50 min)+(1 hr and 20 min) is (4 hr and 10 min)

2. Make a method displayTime which should print the time.
3. Make a method DisplayMinute which should display the total minutes in the Time. E.g.- (1 hr 2 min) should display 62 minute.

b) Explain exception handling in Python with example. (4)

Module V

19 a) Write a Python code to perform addition, and subtraction on two 3 * 3 arrays. (7)

b) Write Python program to write the following University Topper data of final semester to a CSV file. (7)

Reg. No.	Name	College	Branch	CGPA
ABC123	Ravi K	ABC	CSE	9.8
ECH265	Bennet J	ECH	ME	9.9
FET345	Keerthana K	FET	EEE	9.7
GMT734	Adil M	GMT	ECE	9.75

OR

20 a) Write a Python program using Pandas to read a csv file named student_academics.csv with fields *Name, Reg No, Internal Mark, Attendance, Arrear_count, and CGPA* and to print the following: (4)

1. Number of rows and columns
2. Last five rows

b) Percentage of marks and attendance attained by a student on different semesters are stored in a CSV file as 'Student_data.csv' with the fields *Semester, Marks and Attendance.* (10)

1.Draw a bar chart of the student performance with Semester on the x-axis and Marks on the y-axis.

2. .Draw a pie chart to visualize student Attendance.

Give appropriate titles and labels in the plots.

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