Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S6 (R,S) / S4 (PT) (R,S) Examination May 2024 (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. Let the variable x be "dog" and the variable y be "cat". Write the values returned by the following operations: a) x*4 +' ' + 4*y   b) x*len(x+y)   (3)

2. What will be the output if the following code fragments are executed? (3)

   for j in range(2,10,4):

      print(j)

3. Write a python program to create a list of squares for the numbers from 0 to 9 using list comprehension. (3)

4. Write a user-defined function to generate even numbers between 1 and 25. (3)

5. How can you set the drawing speed of the turtle in the Turtle module? Give an example (3)

6. List the steps to create a GUI application using Tkinter (3)

7. How can you achieve method overriding in Python OOP? (3)

8. How does the __init__ method differ from other methods in a Python class? (3)

9. Write a python program to create a 3x3 matrix named A with random integer values between 1 and 10. (3)

10. How does the **isnull()** function in pandas contribute to handling missing values?. (3)

PART B
Answer one full question from each module, each carries 14 marks.
Module I

11. a) Write a python program to find out the eldest and youngest of three individuals, with their ages being input through the keyboard.(without using max, min functions) (7)

    b) Consider the mathematical expression $(a+b)^2=a^2+2ab+b^2$. Write a Python program that takes user input for values of a and b, then evaluates both sides of (7)

the expression. Finally, compare the results and print whether the equation holds true or false.

OR

12 a) Enumerate the various selection structures and control statement types in Python and elucidate each with suitable examples.   (8)

    b) Write a python program to print factorial of a given number.   (6)

Module II

13 a) Describe the concept of recursive function in Python with suitable example.   (7)

    b) Explain how to read numeric values from a file, perform some operations, and then write the results back to the file?   (7)

OR

14 a) Compare and contrast the fundamental characteristics and use cases of lists, tuples, and sets in Python.   (7)

    b) Create a Python program that uses a dictionary to store the names and ages of people. Ask the user to enter a name, and the program should display the age of that person.   (7)

Module III

15 a) How to draw a square and hexagon using turtle module in Python.   (7)

    b) Describe the methods and Python modules commonly used for converting a color image to a grayscale image.   (7)

OR

16 a) Design a Python GUI program that takes user input for the length and width of a rectangle, and when a button is pressed, calculates and displays the area of the rectangle.   (8)

    b) How do you display an image with a caption using Python in a graphical interface?   (6)

Module IV

17 a) A class Car with attributes registration_number, color, mileage and year, and a method to display information about the car. Write a Python program to create an instance of the Car class and demonstrate how to access and modify its attributes.   (7)

    b) Define a base class "Shape" with attributes width and height, and a method to calculate the area. Create two subclasses: "Rectangle" and "Triangle" inheriting   (7)

from the "Shape" class. Demonstrate polymorphism by calling the area calculation method on instances of both subclasses.

OR

18 a) What is an abstract class in Python OOP? Explain with an example. (7)

b) Illustrate with suitable examples how exceptions are handled in Python. (7)

Module V

19 a) Write a python program to create two numpy arrays of random integers between (7)
0 and 20 of shape (3, 3) and perform the following operations.

1. Perform element-wise addition of two NumPy arrays.

2. Calculate the mean and standard deviation of first NumPy array.

3. Multiply each element of first NumPy array by a scalar value.

4.Compute the dot product of two matrices using NumPy.

b) Create a Matplotlib plot with two lines representing the functions y=sin(x) for (7)
$0 \leq x \leq 2\pi$ (use a solid line) and y=cos(x) for $0 \leq x \leq 2\pi$ (use a dashed line).
Customize the plot by adding appropriate ticks, labels for the x and y axes, and a
legend to distinguish between the two functions.

OR

20 a) Consider a CSV file 'students.csv' with columns such as 'student_id', 'name', (7)
'gender', 'birth_date', and 'grade'. Write commands to do the following using
panda library.

1) Display the first 5 records

2) Print all student names in ascending alphabetical order

3) Print the name of the student with the highest grade

4) List the names of male students

b) Write Python program to write the data given below to a CSV file (7)

Name	Age	City	Occupation	Salary
Ram Roy	35	Mumbai	Teacher	75,000
Jack Tom	37	Delhi	Doctor	90,000
Susan Jit	33	Chennai	Engineer	85,000
Jilt Joy	40	Kolkata	Architect	70,000

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