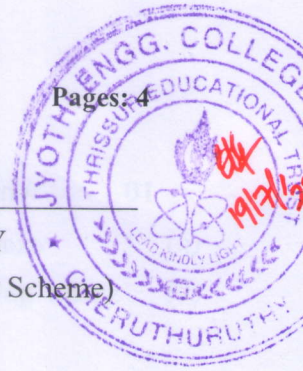Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R, S) / S4 (PT) (R, S) Examination June 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   Jack says that he will not bother with analysis and design but proceed directly to   (3)
coding his programs. Why is that not a good idea?

2   Write the output of the following python statements :   (3)
i) round(12.57)   ii) 5//2   iii) int(6.5)

3   Write the output of following python code :   (3)

S = "Computer"

print(S[::2])

print(S[::-1])

print(S[:])

4   Write a recursive function in python to find GCD of two numbers.   (3)

5   Illustrate the function of following methods in turtle   (3)
i) turtle.setheading(0)   ii)turtle.forward(50)   iii) turtle.left(90)

6   Describe two fundamental differences between terminal-based user interfaces   (3)
and GUIs.

7   Explain what the __ **str** __ method does and why it is a useful method to include   (3)
in a class.

8   Compare multiple and multilevel inheritance   (3)

9   Write the output of the following python code: (3)

import numpy as np

arr1 = np.arange(6).reshape((3, 2))

arr2 = np.arange(6).reshape((3,2))

arr3 = arr1 + arr2[0].reshape((1, 2))

print(arr3)

10   What is the difference between **loc** and **iloc** in pandas DataFrame. Give a suitable   (3) example.

PART B

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

Module I

11   a)   Write a python program to find the sum of the cosine series $1 - x^2/2! + x^4/4! - $ (7) ......

    b)   Write a python program to find X^Y or **pow(X,Y)** without using standard   (7) function

OR

12   a)   Write a python program to generate the following type of pattern for the given N   (7) rows where N <= 26.

A

A B

A B C D

A B C D E

    b)   Write a python program to generate prime numbers within a certain range   (7)

Module II

13   a)   Assume that the variable data refers to the string "Python rules!". Use a string   (6) method to perform the following tasks:

a. Obtain a list of the words in the string.

b. Convert the string to uppercase.

c. Locate the position of the string "rules" .

d. Replace the exclamation point with a question mark.

    b)   Write a code segment that opens a file for input and prints the number of four-   (8) letter words in the file

OR

14   a)   Assume that there is a text file named "numbers.txt". Write a python program to   (10) find the median of list of numbers in the file without using standard function for median.

    b)   Use higher order python function **filter** to extract a list of positive numbers from   (4) a given list of numbers. You should use a lambda to create the auxiliary function.

Module III

15 a) Write a python function to draw a square using turtle graphics   (5)

   b) Write a python function to covert an image to black and white using image   (9)
       processing methods.

OR

16 a) Write a python function to draw an hexagon using turle graphics   (5)

   b) Write a python function to shrink an image by a given factor. The function suppose (9)
       to builds and returns a new image which is smaller copy of the argument image,
       by the factor argument.

Module IV

17 a) Write Python program to create a class called as **Complex** to model complex   (9)
       numbers and implement _add__( ) and __mul__() methods to add and multiply
       two complex numbers. Display the result by overloading the + and * operator.

   b) Explain multiple inheritance in Python with a suitable example   (5)

OR

18 a) Write a Python program to create a class called as **Rational** to model rational (9)
       numbers and associated operations. Implement the following methods in the class.
       Use operator overloading.

       1. Reduce() − to return the simplified fraction form

       2. __add__() - to add two ratioanal numbers

       3. __lt__() - to compare two rational numbers (less than operation)

   b) What is Exception handling? Write a program that opens a file and writes "Hello   (5)
       Good moring" to it. Handle exceptions that can be generated during I/O operations

Module V

19 a) Write a code segment that prints the names of all of the items in the current   (5)
       working directory.

   b) Write a python program to create two numpy arrays of random integers between   (9)
       0 and 20 of shape (3, 3) and perform matrix addition, multiplication and transpose
       of the product matrix.

OR

20 a) Write Python program to write the data given below to a CSV file named   (4)
       student.csv

       fields = ['Name', 'Branch', 'Year', 'CGPA']

rows = [['Nikhil', 'CSE', '2', '8.0'],

['Sanchit', 'CSE', '2', '9.1'],

['Aditya', 'IT', '2', '9.3'],

['Sagar', 'IT', '1', '9.5']]

b) Consider the above **student.csv** file with fields Name, Branch, Year, CGPA .   (10)
Write python code using pandas to

1) To find the average CGPA of the students

2) To display the details of all students having CGPA > 9

3) To display the details of all CSE students with CGPA > 9

4) To display the details of student with maximum CGPA

5) To display average CGPA of each branch

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