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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 coding his programs. Why is that not a good idea?	(3)
2	Write the output of the following python statements : i) round(12.57) ii) 5//2 iii) int(6.5)	(3)
3	Write the output of following python code : S = "Computer" print(S[::2]) print(S[::-1]) print(S[:])	(3)
4	Write a recursive function in python to find GCD of two numbers.	(3)
5	Illustrate the function of following methods in turtle i) turtle.setheading(0) ii)turtle.forward(50) iii) turtle.left(90)	(3)
6	Describe two fundamental differences between terminal-based user interfaces and GUIs.	(3)
7	Explain what the __ **str** __ method does and why it is a useful method to include in a class.	(3)
8	Compare multiple and multilevel inheritance	(3)
9	Write the output of the following python code: 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)	(3)

10 What is the difference between **loc** and **iloc** in pandas DataFrame. Give a suitable example. (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 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 function (7)

OR

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

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 method to perform the following tasks: (6)

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-letter words in the file (8)

OR

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

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

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 processing methods. (9)

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 to builds and returns a new image which is smaller copy of the argument image, by the factor argument. (9)

Module IV

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

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 numbers and associated operations. Implement the following methods in the class. Use operator overloading. (9)

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 Good moring" to it. Handle exceptions that can be generated during I/O operations (5)

Module V

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

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

OR

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

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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