

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Sixth Semester B.Tech Degree Examination June 2022 (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 print statement in Python?
(a) print (9//2) (b) print (9/2) | (3) |
| 2 | Write a Python program to count number of even numbers and odd numbers in a given set of n numbers. | (3) |
| 3 | Illustrate the use of negative indexing of list with example. | (3) |
| 4 | Write Python code for the following statements
i) writes the text "PROGRAMMING IN PYTHON" to a file with name code.txt
ii) then reads the text again and prints it to the screen. | (3) |
| 5 | List any three image processing Python libraries. | (3) |
| 6 | List the steps to create a GUI application using Tkinter | (3) |
| 7 | How to create a destructor in Python? Give an example. | (3) |
| 8 | Write a Python class which has two methods get_distance and print_distance. get_distance accept a distance in kilometres from the user and print_distance print the distance in meter. | (3) |
| 9 | How do you assign a random number to a variable in Python? | (3) |
| 10 | What is the use of os module in python? | (3) |

PART B

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

Module I

- 11 a) Write a python program to generate the following type of pattern for the given N (6)
- rows .
- 1
- 1 2
- 1 2 3
- 1 2 3 4

- b) Mention the different types of loop and control statements allowed in Python (8) and explain each type with suitable examples.

OR

- 12 a) Write the python program to print all prime numbers less than 1000. (7)
b) Write a Python program to find distance between two points (x1,y1) and (x2,y2). (7)

Module II

- 13 a) Write a Python program to count how many times each character appears in a given string and store the count in a dictionary with key as the character. (7)
b) Create a function min_max() that takes n numbers as list argument and return the smallest and largest numbers. (7)

OR

- 14 a) Write a Python program to read n integers into a list and separate the positive and negative numbers into two different lists. (7)
b) Create a dictionary of names and birthdays. Write a Python program that asks the user to enter a name, and the program display the birthday of that person. (7)

Module III

- 15 a) How to draw a star shape using turtle in Python. (5)
b) Explain basic image processing with inbuilt functions in Python. (9)

OR

- 16 a) Write Python GUI program to take the birth date and output the age when a button is pressed. (7)
b) How do you display an image in Python GUI?. (7)

Module IV

- 17 a) Demonstrate how polymorphism can be implemented using function overloading with suitable example. (7)
b) Illustrate with a real life example how multi-level inheritance is implemented in Python. (7)

OR

- 18 a) Create an Abstract Base Class called Shape that include abstract methods area() and circumference(). Then derive two classes Circle and Rectangle from the Shape class and implement the area() and circumference() methods . Write a Python program to implement above concept. (7)
b) How exceptions are handled in Python?. Illustrate with the help of an example. (7)

Module V

- 19 a) Explain how the matrix multiplications are done using numpy arrays. (7)
- b) How to plot two or more lines on a same plot with suitable legends, labels and a title. (7)

OR

- 20 a) Consider a CSV file 'employee.csv' with the following columns(name, gender, start_date ,salary, team). (8)

Write commands to do the following using panda library.

1. print first 7 records from employees file
 2. print all employee names in alphabetical order
 3. find the name of the employee with highest salary
 4. list the names of male employees
 5. to which all teams employees belong
- b) Write Python program to write the data given below to a CSV file (6)

Reg_no	Name	Sub_Mark1	Sub_Mark2	Sub_Mark3
10001	Jack	76	88	76
10002	John	77	84	79
10003	Alex	74	79	81

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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 <code>__str__</code> 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 $1 - x^2/2! + x^4/4! - \dots$ (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 (7)
- rows where $N \leq 26$.
- ```
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 method to perform the following tasks: (6)
- Obtain a list of the words in the string.
  - Convert the string to uppercase.
  - Locate the position of the string "rules" .
  - 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 convert an image to black and white using image processing methods. (9)

**OR**

- 16 a) Write a python function to draw a hexagon using turtle graphics (5)  
 b) Write a python function to shrink an image by a given factor. The function should build and return a new image which is a 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 rational 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 morning" 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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