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SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SEVENTH SEMESTER B. TECH DEGREE EXAMINATION (R), DECEMBER 2023

(2020 SCHEME)

Course Code: **20CST443**

Course Name: **Python for Engineers**

Max. Marks : **100** **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. What happens when your computer runs a Python program?
2. Let x = 4 and y = 2. Write the values of the following expressions:
   a) x*x ** y **y.
   b) x % y **x.
   c) x // 6 .
3. Illustrate the use of negative indexing of list with example.
4. The math module includes a pow function that raises a number to a given power, write a code segment that imports this function.
5. When are the following built-in exceptions raised? Give examples to support your answers.
   a) IOError b)NameError c)ZeroDivisionError
6. Write Python program to create a class called as Complex and implement __add__ () method to add two complex numbers.
7. Write a python program to read a text file, copy the content to another file after removing the blank lines.
8. Write a note on the os and os.path modules in Python. Also, explain the *walk ()* and *getcwd ()* methods of the os module.
9. Differentiate between a Python list and a NumPy array
10. Write Python code to plot a sin wave (from 0 to 2*pi) using matplotlib library with proper title, xlabel and ylabel.

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) Write the python program to print all prime numbers less than 100. (7)
    b) Write a program that prompts the user to enter angle in degrees and convert the angle in degrees to radians. (7)

OR

12. a) Write a Python program to count number of even numbers and odd numbers in a given set of n numbers. (7)

b) What are the possible errors in a Python program. Write a Python program to print the value of $2^{2n} + n + 5$ for n provided by the user. (7)

MODULE II

13. a) Create a function min_max0 that takes a list of n numbers as argument and return the smallest and largest numbers. (7)

b) Write a Python program to read numbers and find minimum, maximum and sum using Tuple. (7)

OR

14. a) Let D = {'a': 10, 'b': 20} be a dictionary. Write commands to
    a. Add new key value pairs ('p': 20), ('c':30), ('z': 70)
    b. Update the value correspond to the key 'a' to 100
    c. Remove the entry correspond to the key 'b'
    d. Display the data in the dictionary in alphabetical order of key. (8)

b) Write a Python program to find the frequency of any word in a string. (6)

MODULE III

15. a) Define a class in Python to store the details of students (roll no, mark1, mark2) with the following methods
    a. readData()- to assign values to class attributes
    b. computeTotal()-to find the total marks
    c. printDetails()- to print the attribute values and total marks.
    Create an object of this class and invoke the methods. (8)

b) How to create a constructor in python? Give an example. (6)

OR

16. a) Demonstrate how polymorphism can be implemented using function overloading with suitable examples. (7)

b) Illustrate with a real-life example how multi-level inheritance is implemented in Python. (7)

MODULE IV

17. a) Given the sales information of a company as CSV file with the following fields *month_number, facecream, facewash, toothpaste, bathingsoap, shampoo, moisturizer, total_units, total_profit.* Write Python codes to visualize the data as follows
    1) Toothpaste sales data of each month and show it using a scatter plot
    2) Face cream and face wash product sales data and show it using the bar chart
    3) Calculate total sale data for last year for each product and show it using a Pie chart. (9)

b) Write Python code to plot histogram of marks of students stored in a list L with proper title, xlabel and ylabel using matplotlib library. (5)

OR

18. a) Write a Python program to store lines of text into a file. Read the file and display only the palindrome words in the file. (8)
    b) List and explain any 3 methods of os and sys module. (6)

MODULE V

19. a) Write a Python program to add two matrices and also find the transpose of the resultant matrix. (7)
    b) Write a Pandas program to add, subtract, multiply, and divide two Pandas series. (7)
    Sample Series: [2, 4, 6, 8, 10], [1, 3, 5, 7, 9]

OR

20. Given a file "auto.csv" of automobile data with the fields index, company, body-style, wheel-base, length, engine-type, num-ofcylinders, horsepower, average-mileage, and price**.** Write Python codes using Pandas to (14)
    1) Clean and Update the CSV file
    2) Print total cars of all companies
    3) Find the average mileage of all companies
    4) Find the highest priced car of all companies.

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