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Reg. No:

VIT
Vellore Institute of Technology

Final Assessment Test – November 2024

Course: TCSE207L - Computer Programming: Python

Class NBR(s): 5179/5181 Slot: A1

Time: Three Hours Max. Marks: 100

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer ALL Questions

(10 X 10 = 100 Marks)

1. a) Restaurant manager wants to develop a restaurant management system to handle its daily operations more efficiently. This system should manage tasks such as adding new menu items, recording customer orders, and tracking inventory levels. Illustrate with suitable data items and Python data types that can be effectively used to manage and manipulate data required for the restaurant management system. **[5]**

   b) Explain the various operators in Python, with suitable examples for each one. **[5]**

2. In a company an employee is paid as per the details given: If Basic Salary <= 15000, then HRA = 18.5% of Basic Salary, DA = 73.45% of Basic Salary. If Basic Salary <= 30000 and >15,000, then HRA = 27.81% of Basic Salary, DA = 83.33% of Basic Salary. If Basic Salary > 30,000, then HRA = 40.05% of Basic Salary, DA =91.19% of Basic Salary. Gross Salary = Basic Salary + HRA + DA. If the employee's salary is input through the keyboard write a python program to find his gross salary.

3. An online store wants to implement a discount program to encourage customer loyalty. The store has different membership levels, and each level has specific discount criteria:

   Bronze Members: 5% discount if they spend more than $50.

   Silver Members: 10% discount if they spend more than $100.

   Gold Members: 20% discount if they spend more than $200.

   Non-members: No discount. Write a Python program that calculates the discount based on the customer's membership level and purchase amount by using conditional branching statements

4. List the different types of looping statements in python and explain them with suitable example.

5. An e-commerce store needs an efficient system to manage its inventory. The store's inventory includes various products, and each product has a name, price, and quantity. Write a python program to perform various operations on this inventory list, such as adding new products, updating product quantities, and removing sold-out products with appropriate syntax and functions.

6. a) Imagine you're a data analyst at a retail company. Each branch of your store maintains separate sales data in dictionaries for different periods. You need to combine these dictionaries to create a comprehensive dataset for the entire company. You have three dictionaries representing sales data from three different branches. Each dictionary contains the sales amounts for different products (key: product ID, value: sales amount). You need to merge these dictionaries to create a unified dataset. [5]

Sample Input:

dic1 = {1: 10, 2: 20}
dic2 = {3: 30, 4: 40}
dic3 = {5: 50, 6: 60}

Output:

{1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}

b) Discuss various methods for the data structure called set in python with suitable examples. [5]

7. Imagine you're working on a customer feedback system for an online store. Each feedback entry consists of the customer's ID, the product ID, the rating (out of 5), and the actual feedback message. You need to extract and process specific parts of each feedback entry to store them in a structured format.

K= ["CUST1234 PRO56789 5 Excellent product, highly recommend!", "CUST5678 PRO98765 3 Average quality, not very satisfied."]

Write a python program to perform the string slicing operation for following task:

a) Extract the customer ID from each feedback entry [2.5]
b) Extract the product ID. [2.5]
c) Extract the rating [2.5]
d) Extract the feedback message [2.5]

8.(a) i) Write a Python program that checks if a given mobile number is valid or not using regular expressions. Also specify with 5 valid and in-valid strings as instances and check the string where the length is ten digits.

ii) Explain five different string methods in Python with a suitable program.

OR

8.(b) The university wants to manage its student database using python sets.

Students_Python_course = {"Raja", "Ramu", "Rani", "Mary"}
Students_Cancer biology_course = {"Ramu", "Rani", "Charles", "Diana"}
Students_certified = {"Mary", "Charles", "Rani", "Ramu"}
Students_internship = {"Raja", "Diana", "Eve", "Ramu"}
Develop a python program to:

i) Find all unique students enrolled in either Python_course or Cancer biology_course **[2.5]**

ii) Identify students who are enrolled in Python_course and have also completed certifications. **[2.5]**

iii) Determine the students who are only in Python_course and not in Cancer biology_course **[2.5]**

iv) Find students who have applied for internships but are not enrolled in Python_course **[2.5]**

9. Write a Python program that functions as a basic calculator. It should include operations for addition, subtraction, multiplication, and division using functions.

10.(a) An organization wants to visualize the popularity of various programming languages to understand trends and make data-driven decisions. They decide to use both bar and pie charts for this visualization. Create a Python program that generates both a bar chart and a pie chart to display the popularity of different programming languages using the sample data.

Sample data:

Programming languages: Java, Python, PHP, JavaScript, C#, C++

Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7

OR

10.(b) A company specializing in industrial automation was tasked with developing a new control system for manufacturing plants. The system needed to monitor and manage various manufacturing processes, ensuring efficiency and safety. How the Waterfall approach can be effectively applied to embedded product development, ensuring a systematic and thorough process from requirements gathering to maintenance and updates.

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