VIT®

Vellore Institute of Technology

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Reg. No. : 24MCA1034

Final Assessment Test(FAT) - Nov/Dec 2024

Programme	**M.C.A.**	Semester	**Fall Semester 2024-25**
Course Code	**PMCA602L**	Faculty Name	**Prof. Saleena B**
Course Title	**Python Programming**	Slot	**C1**
		Class Nbr	**CH2024250103070**
Time	**3 hours**	Max. Marks	**100**

General Instructions

- Write only Register Number in the Question Paper where space is provided (right-side at the top) & do not write any other details.

Course Outcomes

1.Develop solutions using the basic programming constructs and data structures in python.

2.Demonstrate applications with user-defined functions and applying exception-handling mechanisms.

3.Apply object-oriented programming constructs in designing complex real-world problems.

4.Examine and visualize the data sets using python packages.

Section - I

Answer all Questions (4 × 10 Marks) *M - Marks

Q.No	Question	*M	CO	BL
01.	Create an inventory with book titles and the number of copies available in the bookstore. Allow users to purchase books by entering the book title and the number of copies they wish to buy. If the requested number of copies is available in the inventory, deduct the number of copies from the inventory and print a confirmation message. If the requested number of copies is not available, print a message indicating insufficient stock. Implement a loop that continues to accept purchase requests until the user decides to exit. Write a python program using appropriate data structures and constructs to implement the above scenario.	10	1	3
02.	Assume that you are working on a customer support system for an online retailer. Your task is to create a string which will store the customer feedback messages. The feedback message contain the email address, order number, dates of delivery and phone number of the customers.(2 Marks) Write regular expressions to • Find all email addresses in the customer feedback messages. (3 Marks) • Extract order numbers which follow the format ORD123456 where 123456 is any six-digit number. (2 Marks) • Extract phone numbers of customers in the format (044) 26376076 or (+91)9840597888 (3 Marks) Write a Python Program using regular expression and their methods to implement the above scenario.	10	1	1

03.	Write a python program to perform the following tasks. a) Create a list containing N numbers. Each number should contain at least three digits. If any number is less than 3 digits or greater than 3 digits or contains any non-numeric character then an exception must be raised.(4 Marks) b) Extract the first and third digits from each number N. Store these digits as a pair in a tuple for each ID. Create a dictionary where each tuple (first and third digits) is a **key**. The **value** for each key is the sum of the two digits.(6 Marks)	10	1	3
04.	Consider the example given below , which has an input list of email addresses that may contain extra spaces , inconsistent casing , empty strings and None values. Write a python program using function that creates a new list named cleaned Email list where these email addresses are converted to lowercase and trimmed of any leading or trailing spaces. It should also skip None and empty strings from the list. Display the input and the cleaned email list. **Example:** **Input list:** ["Example1@domain.com","USER2@DOMAIN.COM", " user3@domain.com", None, "", "user4@domain.COM "] **Cleaned Email list:** ['example1@domain.com','user2@domain.com','user3@domain.com','user4@domain.com']	10	2	4

Section - II

Answer all Questions (4 × 15 Marks) *M - Marks

Q.No	Question	*M	CO	BL
05.	Develop a student management system in python for a school to handle various tasks. Each student will have an ID, Name and 5 subject marks. a) Write functions to implement the following tasks using arbitrary positional and keyword arguments as the function arguments. (9 Marks). • Read a student record from a file and store them in a dictionary. • Calculate the average marks of a student and assign grades based on the average marks. A: 90-100, B: 80-89, C: 70-79, D: 60-69, F: below 60 • Generate a report card for a student, displaying their name, marks in each subject, average marks, and grade and store the report to a file. b) Create a file to store the student details and their report card details.(6 marks)	15	2	5
06.	Create a class called Matrix and initialize the rows and columns. (2 Marks) Write a python program using functions to implement matrix addition using operator overloading. (7 Marks). Incorporate any two appropriate built in exception handling methods that may occur during addition of 2 matrices. (6 Marks)	15	2	4

07.	Create a base class named *Account* with attributes account number, account holder name and balance and methods for deposit and withdrawal of money. Create two derived classes named *savings account* and *checking account.* *Savings account* class includes attributes like interest rate and a method to update the interest for the account balance, and *checking account* class includes attributes like transaction limit and a method to check whether the transaction limit is maintained or not. Write python programs to a) Implement the above inheritance scenario using constructors to initialize the appropriate attributes and instantiate objects to check all the methods. (9 Marks) b) Overload the function/method in the *Account* class to handle deposits in various formats, like depositing a single amount , depositing multiple amounts, depositing an amount to another account. (6 Marks)	15	3	3
08.	Write a Python script that uses NumPy and Pandas to perform the following tasks: Use the functionalities provided by NumPy and pandas to efficiently analyze and visualize the dataset. (5 * 3= 15 Marks) a) Load the dataset from a CSV file into a pandas Data Frame. Clean and preprocess the data by handling missing values, removing outliers, and standardizing numeric columns. b) Calculate descriptive statistics, such as mean, median, and standard deviation, for selected columns. c) Perform data aggregation and grouping operations to generate summary statistics. d) Apply filtering and sorting to extract subsets of the data based on specific criteria. e) Visualize the data using matplotlib and draw a scatter plot.	15	4	6

BL-Bloom's Taxonomy Levels - (1.Remembering, 2.Understanding, 3.Applying, 4.Analysing, 5.Evaluating, 6.Creating)