MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)
SECOND SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)

MG2DSCCSC100- PYTHON PROGRAMMING

Instructions to Examiners

Duration of the Examination: 1.5 Hrs
Maximum Marks: 35

- Students must submit the Lab Record to attend the Semester End Examination.
- The examiner will assign two questions from the provided list to each student.
- Ask students to write the procedure/ Source code in Pythonfor the assigned problem.
- Conduct a Viva-Voce(oral examination) on the problem.

Evaluation Criteria:

- Logic - 10 Marks
- Successful Compilation - 5 Marks
- Output - 5 Marks
- Viva - 10 Marks
- Record - 5 Marks

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List of Questions

1. Write a Python Program to prompt for a score between 0.0 and 1.0. If the score is out of range, print an error. If the score is between 0.0 and 1.0, print a grade using the following table.

Score	Grade
>= 0.9	A
>= 0.8	B
>= 0.7	C
>= 0.6	D
< 0.6	F

[A][CO4]

2. Write a Python Program to check if a given year is a Leap Year. [A][CO4]
3. Write a Python program to check whether a number is palindrome or not. [A][CO4]
4. Write a Python Program to find the sum of digits in a number. [A][CO4]
5. Write a Python Program to display the Fibonacci Sequences up to n^{th} term where n is provided by the user. [A][CO4]
6. Write a Python Program to find the sum of all odd and even numbers up to a number specified by the user. [A][CO4]
7. Write a Python Program to find the factorial of a number. [A][CO4]
8. Write a Python Program to check whether a number is Prime or not. [A][CO4]
9. Write a Python Program to find the area of Trapezium using the formula Area = (1/2) * (a + b) * h,where a and b are the 2 bases of Trapezium and h is the height (Use function) [A][CO4]
10. Write a Python Program to check if a 3 digit number is Armstrong number or not using functions. [A][CO4]
11. Write a Python program to find the largest of three numbers using functions. [A][CO4]
12. Write a Python program using functions to find the value of ${}^{n}P_{r}$ and ${}^{n}C_{r}$. [A][CO4]
13. Write Python Program to sort numbers in a List in ascending order. [A][CO4]
14. Write Python Program to search for a number in the List and report 'Success' or 'Failure'. [A][CO4]

15. Write a python Program to find Mean, Variance and Standard Deviation of numbers in a List. [A][CO4]
16. Write a Python Program to add two matrices using List. [A][CO4]
17. Create a list containing three elements, and then create a tuple from that list. [A][CO4]
18. Write a Python program to store the latitude and longitude of a place as a tuple and display it. [A][CO4]
19. Write a program that takes a range and creates a list of tuples within that range with the first element as the number and the second element as the square of the number. [A][CO4]
20. A school maintains a tuple of student records, where each record consists of a student's name, age, and marks in three subjects. Write a Python program to display the details of all students, Search for a particular student and Calculate and print the average marks of each student. [A][CO4]
21. Write a Python Program to generate a Dictionary that contains (i: i*i) such that i is a number ranging from 1 to n. [A][CO4]
22. Write a Python Program that accepts a sentence and calculate the number of digits, uppercase and lowercase letters(Use Dictionary). [A][CO4]
23. Write a Python program to input information about a few employees as given below:
    a. Name
    b. Employee Id
    c. Salary

    The program should output the employee ID and salary of a specified employee, given his name (Use Dictionary). [A][CO4]
24. Write Python code to create a dictionary that accepts a country name as a key and its capital city as the value. Display the details in sorted order. [A][CO4]
25. Write a program that has the dictionary of student names as keys and phone numbers as its values. Print the dictionary in a sorted order. Prompt the user to enter the name and check if it is present in the dictionary. If the name is not present, then enter the details in the dictionary. [A][CO4]
26. Write a Python program to find the length of the set. [A][CO4]
27. Write a program to create an intersection, union, set difference, and symmetricdifference of sets.
    [A][CO4]
28. Write a program to read the first n lines of a file. Prompt the user to enter the value for n. [A][CO4]
29. Write a program that reads the contents of the file and counts the occurrences of each letter. Prompt the user to enter the filename. [A][CO4]
30. Write a program to read and write the contents from one csv file to another. [A][CO4]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS)
SECOND SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)
MG2MDCCSC100- Data visualization using PYTHON

Instructions to Examiners

Duration of the Examination: 1.5 Hrs.
Maximum Marks: 35

- Students must submit the Lab Record to attend the Semester End Examination.
- The examiner will assign one question from the provided list to each student.
- Ask students to write the procedure/ Source code in Pythonfor the assigned problem.
- Conduct a Viva-Voce(oral examination) on the problem.

Evaluation Criteria:

- Result - 20 marks
- Viva-10 marks
- Lab Record- 5 marks

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MGU-UGP (HONOURS)

SECOND SEMESTER PRACTICAL EXAMINATION

(2024 ADMISSION ONWARDS)

MG2MDCCSC100- Data Visualization using PYTHON

Duration of the Examination: 1.5 Hrs. Maximum Marks: 35

List of Questions

1.Program to create a simple line plot using matplotlib.

2. Create a line plot showing the GDP growth of a country over 10 years.Customize the plot with appropriate labels for the axes,a title, and a legend.
3. Create a bar plot using matplotlib.
4. Create a horizontal bar plot using matplotlib.
5. Program to create a bar plot using labels, legends in matplotlib.
6. Create a bar plot displaying the average monthly income of workers in different industries(eg. agriculture,IT,Healthcare).
7. Program to create a scatter plot using matplotlib.
8. Plot the relationship between population growth and unemployment rate for five countries. Use different colours for the points.
9. Program to create a sub plot using matplotlib.

10.Program to create a figure with multiple subplots using matplotlib.

11.Program to create a line plot using seaborn.

12.Program to create a scatter plot using seaborn.

13.Program to create a bar plot using seaborn.

14.Program to create a histogram using seaborn.

15.Program to create a box plot using seaborn.

16.Program to create a box plot with a theme using seaborn.

17.Use different seaborn themes(eg, "darkgrid","whitegrid") to plot a histogram of household incomes.

18.Program to create a multi-grid facetGrid using seaborn.

19.Program to create a multi-grid PairGrid using seaborn.

20. Program to create a multi-grid JointGrid using seaborn.
21. Program to create a stripplot in categorical plot using seaborn.
22. Program to create a Boxplot in categorical plot using seaborn.
23. Program to create a Violinplot in categorical plot using seaborn.
24. Create a bar plot showing the average expenditure on food, education, and healthcare by income groups(low, middle ,high) in categorical plot.
25. Program to create a Swarmplot in categorical plot using seaborn.
26. Program to create a combined Swarm+Violin plot using seaborn.
27. Create an interactive line chart showing the import and export data of a country over a decade using Plotly
28. Program to create a Plotly in simple dashboard creation.

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MGU-UGP (HONOURS)
SECOND SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)

MG2MDCCSC101- MASTERING SPREADSHEETS

Instructions to Examiners

Duration of the Examination: 1.5 Hrs.
Maximum Marks: 35

- Students must submit the Lab Record to attend the Semester End Examination.
- The examiner will assign one question from the provided list to each student.
- Ask students to write the procedurefor the assigned problem.
- Conduct a Viva-Voce(oral examination) on the problem.

Evaluation Criteria:

- Procedure - 10 Marks
- Output - 10 Marks
- Viva - 10 Marks
- Record - 5 Marks

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MGU-UGP (HONOURS)
SECOND SEMESTER PRACTICAL EXAMINATION
(2024 ADMISSION ONWARDS)

MG2MDCCSC101- MASTERING SPREADSHEETS

Duration of the Examination: 1.5 Hrs. Maximum Marks: 35

List of Questions

1. Create a spreadsheet to store student details, including Name, Department, Age, Date of Birth, and Marks for three subjects. Perform the following tasks:
    a) Add columns to calculate the total marks and percentage of marks obtained.
    b) Assume the pass mark as 40% and apply conditional formatting to highlight students based on their performance:
        - 90% and above (e.g., Green)
        - 80% and above (e.g., Blue)
        - 60% and above (e.g., Yellow)
    c) Ensure the table is neatly aligned with appropriate background colors for better readability.

    [A][CO3]

2. Create a spreadsheet to manage and track student attendance. Perform the following tasks:
    a) Include relevant details such as Student Name, Roll Number, Total Working Days, Days Present, and Attendance Percentage.
    b) Use functions to calculate Attendance Percentage (Days Present ÷ Total Working Days × 100).
    c) Apply conditional formatting to highlight students with attendance below 75%.
    d) Ensure proper alignment, background colors, and borders for a well-structured attendance sheet.

    [A][CO3]

3. Create a spreadsheet to manage a grocery store's inventory. Perform the following tasks:
    a) Include columns such as Item Name, Category, Quantity in Stock, Price per Unit, and Total Value.
    b) Use formulas to calculate the Total Value (Quantity × Price per Unit) for each item.
    c) Apply sorting and filtering to view specific categories of items.
    d) Apply proper formatting to make the inventory sheet clear and organized.

    [A][CO3]

4. Create a spreadsheet to store details of 10 items, ensuring the following requirements:
    a) Display the selling price of each item after applying three different discount percentages specified in the column headings.
    b) Automatically highlight the final prices that are less than 1000 using conditional formatting. [A][CO3]

5. Create a spreadsheet to store student details and process the following data:
    a) Calculate the age of each student based on their date of birth.
    b) Determine the number of days passed since their birth until today.
    c) Enter separate fields for House Name, Place, and District, then generate the full address in a single field, formatted as: "Name, House Name, Place, District".
    d) Calculate the average age of 10 students.

    [A][CO3]

6. Create a spreadsheet to store details of students who have applied for the KEAM entrance examination, ensuring the following data processing:
    a) Highlight students who have scored more than 80 marks in Physics using conditional formatting.
    b) Calculate the total marks scored by each student.
    c) Generate a rank list based on total marks in descending order.
    d) Generate a separate rank list for B.Pharm based on Chemistry marks.
    e) Compute the mark difference of each student from the average total marks of all students.

    [A][CO3]

7. A company maintains an employee database containing details such as Employee Name, Department, Salary, and Joining Date. Create a spreadsheet and perform the following tasks:
    a) Sort the employees in ascending order based on their Joining Date to identify the most senior employees.
    b) Sort the employees in descending order based on Salary to view the highest-paid employees at the top.
    c) Filter the list to display only employees from a specific Department (e.g., "Marketing").
    d) Filter the employees who have joined before 2020 to find long-term employees.

    [A][CO3]

8. Create a spreadsheet to store details of UG Honours First-Year students of the college, including their Minor 1, Minor 2, AECs, and MDCs, with the following functionalities:
    a) Enable filtering options to selectively view student details.
    b) Display the list of students who have chosen Computer Science (CS) as MDC.
    c) Display students with Physics as their Major who have selected Economics or Statistics as MDC.
    d) Display students with Chemistry or Mathematics as their Major who have chosen Malayalam as MDC.

    [A][CO3]

9. A company tracks monthly sales of five products. Create a spreadsheet with columns: Product Name, January, February, March, Total Sales, Average Sales, Max Sales, Min Sales.Using formulas, compute the total sales, average sales, highest and lowest sales for each product.

[A][CO3]

10. A company pays salaries with deductions and bonuses. Create a spreadsheet with columns: Employee Name, Basic Salary, Bonus, Deductions, Net Salary.
    a) Using formulas, calculate Net Salary as Net Salary = Basic Salary + Bonus – Deductions.
    b) Use IF() to apply a tax deduction (e.g., if Basic Salary > 50,000, deduct 10%)

[A][CO3]

11. Create a spreadsheet to track student details and calculate their age using date functions. Perform the following tasks:
    a) Store student details, including Name and Date of Birth.
    b) Find current date and calculate each student's age in years
    c) Use the IF() function to check if the student is a minor (below 18 years) and display "Minor" or "Adult" in a separate column.

[A][CO3]

12. Create a spreadsheet to store and format employee details using text functions. Perform the following tasks:
    a) Include columns such as Employee Name, Employee ID, Department, Date of Joining, and Email Address.
    b) Use text functions to:
        - Convert all employee names to uppercase
        - Extract the first three letters of the department
        - Generate a unique employee code by combining the first three letters of the name and department
        - Format the Date of Joining in a proper text format

[A][CO3]

13. Create a spreadsheet to record the monthly rainfall received in Kerala over the past year. Perform the following tasks:
    a) Generate visual representations of the data using line charts and bar charts, with appropriate labels and legends for clarity.
    b) Use a pie chart to depict the proportion of rainfall received in each month.

[A][CO3]

14. Create a spreadsheet to record and analyse the progress of marks scored by students in three subjects over four consecutive test papers. Perform the following tasks:
    a) Store the marks of students in three subjects for all four test papers.
    b) Generate a line chart to visualize the progress of marks for each subject over the tests.
    c) Use a bar chart to compare the total marks scored by students across the tests.

[A][CO3]

15. Create a spreadsheet to track and analyse book borrowing trends in a library using different chart types. Perform the following tasks:
    a) Record the number of books borrowed per month across three different categories (e.g., Fiction, Non-Fiction, Science).
    b) Generate a line chart to visualize the borrowing trend for each category over six months.

c) Create a column chart to compare the number of books borrowed per category each month.

d) Use a pie chart to represent the percentage share of each category's total borrowings in a selected month.

[A][CO3]

16. Create a spreadsheet to analyse monthly expenses and income trends using pie and scatter charts. Perform the following tasks:

    a)Record the monthly income and expenses across different categories (e.g., Rent, Food, Travel, Entertainment, Savings) for a year.

    b) Generate a pie chart to represent the percentage distribution of expenses across different categories in a selected month.

    c) Create a scatter plot to visualize the relationship between total income and total expenses over the months.

    d) Add a trendline in the scatter plot to analyse spending patterns in relation to income fluctuations.

    [A][CO3]

17. Create a spreadsheet data to demonstrate a meaningful pivot table and experiment the pivot table by using different rows, columns and filters.

    [A][CO3]

18. Create a spreadsheet to record and analyse climate data using a Pivot Table. Perform the following tasks:

    a) Prepare a dataset containing columns such as Month, Temperature (°C), Rainfall (mm), and Humidity (%).

    b) Create a Pivot Table to summarize and analyze the climate data.

    c) Experiment with different row and column combinations, such as:

    - Display average temperature per month
    - Show total rainfall for each season

    d) Apply filters to view data selectively, such as:

    - Displaying data for a specific month
    - Viewing records where humidity is above 80%

    [A][CO3]

19. Create a custom macro in a spreadsheet and document the steps involved in its creation and usage. Additionally, observe and record the macro's behaviour after execution.

    [A][CO3]

20. Create and implement a macro in a spreadsheet by following these steps:

    a) Record a Macro to automate a simple task (e.g., formatting a table, applying formulas, or sorting data).

    b) Save and assign a shortcut key to run the macro easily.

    c) Run the Macro on a new dataset and observe the changes.

    [A][CO3]