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End Semester Examination, December 2024
Open Elective – III Semester
Fundamental of Python (OEC034)

Time: 2.5 hrs.

Max Marks: **50**

Note: **All Questions are compulsory.** Marks are indicated against each question.

PART-A

Q.1 **Attempt any five questions:**

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|---|----------------|
| (a) What is the purpose of the break and continue statements in Python loops? | [CO-1] [L-1] 2 |
| (b) Explain the difference between a list and a tuple in Python. | [CO-1] [L-1] 2 |
| (c) What is a lambda function? Provide a basic example? | [CO-1] [L-1] 2 |
| (d) What is NumPy, and why is it commonly used in data analysis? | [CO-1] [L-1] 2 |
| (e) Describe an array in NumPy. How is it different from a list in Python? | [CO-1] [L-1] 2 |
| (f) What are tokens in Python? Give examples of different types of tokens.? | [CO-1] [L-1] 2 |
| (g) How do you create a list comprehension? Provide a simple example? | [CO-1] [L-1] 2 |

2x5

PART-B

- Q.2 (a) Explain how dictionaries can be used to store and access key-value pairs in Python. Provide examples to demonstrate dictionary creation, updating values, deleting entries, and looping through a dictionary.?
- [CO-2] [L-2] 10

OR

- (b) Explain how sets differ from lists in Python. Describe at least five common set operations (e.g., union, intersection) with examples, and discuss when a set would be more appropriate to use than a list?
- [CO-2] [L-2] 10

- Q.3 (a) Creating Simple Bar and Pie Charts in Matplotlib
Describe the steps to create a bar chart and a pie chart using Matplotlib. Provide examples of data that would be suitable for each type of chart and explain how these charts help in understanding data distributions.
- [CO-3] [L-3] 10

OR

- (b) Pandas Data Frame Structure and Key Operations

What is a Pandas Data Frame? Describe its structure, including rows, columns, and indexing. Provide examples of three essential operations that can be performed on Data Frames, such as adding new columns, filtering rows, and calculating summary statistics.

[CO-3] [L-3] 10

- Q.4 (a) Explain the role of exception handling when working with files in Python. Describe common exceptions that may occur during file operations (e.g., FileNotFoundError) and provide examples of how to handle these exceptions using try and except blocks.
- [CO-2] [L-2] 10

OR

- (b) Describe the different methods for reading files in Python (`read()`, `readline()`, and `readlines()`). Provide examples of when each method might be useful and explain how they differ in terms of functionality and performance. [CO-1] [L-1] 10

Q.5 Consider a dataset containing numerical data about the annual income (in thousands) and age of 1000 individuals. As a data analyst, you are asked to perform Quantitative and Graphical Exploratory Data Analysis (EDA) to gain insights into the dataset. Answer the following:

5(a) Graphical EDA

- a. Create a strategy for using scatter plots to explore the relationship between years of experience and salary. Describe how this plot could reveal trends in the dataset.
- b. Explain the use of a histogram to analyze the distribution of employee ages and discuss how adjusting the number of bins impacts interpretation of the data. [CO-4] [L-4] 10

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5(b) Quantitative EDA

- a. Explain how to compute the mean, median, and standard deviation of employees' salaries, and discuss how each of these metrics contributes to understanding the distribution of salaries in the dataset.
- b. Identify and interpret potential outliers using box plots. Describe why identifying outliers is essential in analysing salary data. [CO- 4] [L-4] 10