**Part: 1**

**Question 1.1:** Create a list containing the numbers 1 through 10. Use a for loop to print each element squared.

**Question 2.2:** Given the tuple (100, 200, 300, 400), write a Python program to add a new element (500) at the end of the tuple.

**Question 3.1:** Create a set from the list [1, 2, 3, 1, 2, 3, 4, 5]. Print the set.

**Question 4.1:** Create a dictionary to store the following information: name - John Doe, age - 29, city - New York. Print each value using its key.

**Question 5.1 (If-Else):** Write a Python program that checks if a number stored in a variable is odd or even. Print an appropriate message to the screen.

 **Question 6.1:** Write a lambda function to compute the square of a number and test it using the value 12.

 **Question 6.2:** Use a lambda function to filter and print all the even numbers from a list provided by the user.

**Question 7.1 (while):** Write a program that prompts the user to enter a number nnn. Using a loop, the program should print all numbers from 1 to n−1n-1n−1.

Part-2:

Here are questions based on the employee\_data.csv dataset to test basic data handling skills in pandas:

**Question 1: Load the CSV File**

* Load the CSV file named employee\_data.csv as a DataFrame in Python using pandas.

**Question 2: View Data**

* Display the first 5 rows of the DataFrame.
* Display the last 5 rows of the DataFrame.

**Question 3: DataFrame Summary**

* Use the describe() function to get the summary statistics of the DataFrame.
* Use the info() function to get the basic information about the DataFrame, including the data types and memory usage.

**Question 4: Column Selection**

* Select and print the Salary column of the DataFrame.

**Question 5: Conditional Filtering**

* Filter and display rows where the Age is greater than 30.
* Filter and display rows where the Department is 'IT'.

**Part-3**

**Numpy Questions:**

1. **Create a 1D Numpy Array**: Create a Numpy array containing numbers from 1 to 10.
2. **Create a 2D Numpy Array**: Create a 2D Numpy array with shape (3, 4) filled with random integers.
3. **Array Slicing**: Perform slicing on a Numpy array to extract elements from index 2 to index 5.
4. **Array Operations**: Create two Numpy arrays of the same shape and perform element-wise addition.

**Pandas Questions:**

1. **Create a Pandas Series**: Create a Pandas Series from a list of 5 colors.
2. **Create a Pandas DataFrame**: Create a Pandas DataFrame from a dictionary with columns 'Name', 'Age', and 'City' containing 5 rows of data.
3. **DataFrame Operations**: Perform basic operations on the DataFrame like head(), tail(), describe(), and info().
4. **Filtering Data**: Filter rows based on a specific condition, such as filtering rows where Age is greater than 30.
5. **Adding a New Column**: Add a new column 'Salary' to the DataFrame with random salary values.

Part 4:

**List:**

1. Create a list of 5 fruits and print the third fruit in the list.
2. Add two new elements to the list and print the updated list.
3. Remove the last element from the list and print the list.
4. Check if 'Apple' is in the list and print the result as a boolean value.

**Tuple:**

1. Create a tuple with 3 elements and print the second element.
2. Try to change an element in the tuple and observe the error.
3. Concatenate two tuples and print the result.

**Set:**

1. Create two sets with some common elements and perform a union operation.
2. Find the intersection of the two sets.
3. Add a new element to a set and print the updated set.

**Dictionary:**

1. Create a dictionary with 5 key-value pairs representing student names and their scores.
2. Print all keys from the dictionary.
3. Update the score of one student and print the updated dictionary.

**Numpy:**

1. Create a 1D Numpy array with 5 elements and print the array.
2. Perform element-wise multiplication of two Numpy arrays.
3. Calculate the mean of the Numpy array.

**Pandas:**

1. Create a Pandas Series from a list of 5 cities and print the series.
2. Create a Pandas DataFrame from a dictionary with columns 'Name', 'Age', and 'City' containing 3 rows of data.
3. Sort the DataFrame based on the 'Age' column.

**Lambda Function:**

1. Write a lambda function to double a given number.
2. Write a lambda function to check if a number is even or odd.
3. Use the lambda function to filter a list of numbers and print only the even numbers.

Part 5:

*  What is a list in Python? How is it different from other data structures?
* How do you access elements in a list? What is slicing in a list?
* Discuss the difference between append() and extend() methods in lists.
* How do you remove an element from a list?

 **Tuples**

* What is a tuple? How is it different from a list?
* Can you modify a tuple once it's created? Why or why not?
* How do you convert a tuple to a list and vice versa?

 **Sets**

* What is a set? What are its characteristics?
* Discuss the difference between a set and a list.
* How do you perform set operations such as union, intersection, and difference?

 **Dictionaries**

* What is a dictionary in Python? How does it store data?
* Explain key-value pairs in dictionaries.
* How do you add, remove, or update elements in a dictionary?

 **NumPy**

* What is NumPy? What are its main features?
* How do you create a NumPy array? Provide examples.
* Discuss array indexing and slicing in NumPy arrays.

 **Pandas**

* What is Pandas? How is it used in data analysis?
* How do you create a Pandas Series and DataFrame?
* Explain the difference between loc and iloc in Pandas.

 **Python Data Types**

* Discuss the different data types available in Python (int, float, str, bool).
* How do you convert between different data types?
* What are mutable and immutable data types? Provide examples.

 **Lambda Functions**

* What is a lambda function? When would you use it?
* How do you define a lambda function in Python?
* Discuss the difference between lambda functions and regular functions.