**Exam Questions Programming in Python**

**Block 1**

1. Describe the Python programming language, its features and disadvantages. Describe the process of installing Python or a framework Anaconda
2. Describe creating variables and defining their data types
3. List and give examples of uses of arithmetical, logical, and comparison operators
4. Describe the process of data input/output in the program. Give examples
5. Describe the creation of for and while loops in Python. Give examples.
6. Describe creating functions. Give examples of functions that return and do not return values
7. Describe the use of functions to manipulate strings in Python. Write examples of functions that convert strings to upper and lower case and remove spaces
8. Describe how the values of a string can be replaced with another values. Give examples
9. Describe the process of reversing a string in Python. Give examples of the strings’ reverse.
10. Describe working with files in Python. Give examples of creating files for reading and writing data
11. Describe working with lists in Python. Give examples of traversing a list using a loop.
12. Describe working with tuples in Python. Give examples of creating a list of tuples.
13. Describe working with dictionaries in Python. Give examples of dictionaries.
14. Describe working with lists of list, dictionaries and tuples in Python.
15. Describe working with regular expressions in Python. Give an example of using the matching and data retrieval functions in regular expressions.
16. Describe the difference between positional arguments and keyword arguments in Python functions.
17. Describe the difference between a class and an instance in Python.
18. Describe a lambda function in Python and its typical use cases.
19. Describe the concept of inheritance and polymorphism in Python.
20. Describe the main specifications of the try and except blocks in Python.

**Block 2**

1. Describe working with the Numpy library. Provide examples of Numpy creation of arrays and matrices, as well as array and matrix addition and multiplication operations.
2. Describe working with the Numpy library. Give an example of doing the dot product of vectors using the dot function.
3. Describe the way a NumPy array is created from a Python list.
4. Describe the way the element-wise operations are realized on NumPy arrays.
5. Describe the aggregate functions used in NumPy, and how they work on an array.
6. Describe working with the Pandas library. Give examples of creating a DataFrame, as well as grouping data in a DataFrame.
7. Write about the difference between a Series and a DataFrame in Pandas.
8. Write about the aggregate functions in Pandas, and how they are applied.
9. Describe merge and concat operations in Python. Give examples.
10. Describe the way how to apply a function to every element in a DataFrame.
11. Describe working with the Pandas library. Give examples of selecting data by rows and columns, as well as filtering data
12. Describe working with the Matplotlib library. Give examples of plotting functions using the plot function
13. Describe the ways on how you can change the line style and color in a plot. Write how labels and titles are added to a plot.
14. Describe the way that is used for adding grid lines to a plot in Matplotlib.
15. Describe the way of creating a scatter plot in Matplotlib.
16. Describe working with lists in Python. Give examples of sorting lists and slicing operations
17. Describe working with lists in Python. Give an example of using list functions
18. Describe working with classes in Python. Give examples of creating classes and objects
19. Describe working with collections in Python. Give examples
20. Describe working with files in Python. Describe opening files in binary and text modes

**Block 3**

1. Write a program that iterates through the first 100 numbers (from 0 to 100), and at each iteration prints the sum of the current number and the previous number
2. Write a program that prints only those characters present at an even number of string index. Create your own string
3. Write a program that prints only those characters present at an odd number of string index. Create your own string.
4. Write a program that iterates through a list and prints only those numbers that are divisible by 10. Create your list.
5. Write a program that multiplies numbers from two lists. Create your own lists. If the lists are different in length, make them equal by removing extra numbers.
6. Write a code in Python to reverse a string and check whether the string is a palindrome or not.
7. Write a code in Python to count the number of occurrences of a specific substring in a string.
8. Write a code in Python to find the sum of all elements in the list [10,20,30,40,50, 100, 200, 300]
9. Write a program that renames the key value "city" to "location" in the following dictionary.

sampleDict = {

“ name ”: “Kelly”,

“ age ”: 25,

“ salary ”: 8000,

“ city ”: “ New” York "

}

1. Write a program that returns all elements from two sets that are not present in both of them.

set1 = {10,20,30,40,50}

set2 = {30,40,50,60,70}

1. Write a program that multiplies the following two NumPy arrays.

arrayOne = numpy.array ([[5,6,9], [21,18,27]])

arrayTwo = numpy.array ([[15,33,24], [4,7,1]])

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1. Write a program that removes columns col1 and col3 from a DataFrame

Original DataFrame
col1 col2 col30 1 4 71 4 5 82 3 6 93 4 7 04 5 8 1

1. Write a script in Pandas for loading a CSV file into a DataFrame and displaying the first 10 rows. Use the file name 'data.csv'.
2. Select the columns 'Age' and 'Salary' from a Pandas DataFrame and display them.
3. Write the code for filtering the rows where 'Age' is greater than 30 and 'Gender' is 'Male'.
4. In a Pandas Dataframe, add a new column 'Age in Months' which is the 'Age' multiplied by 12. Then, delete the column 'Age'.
5. In Pandas, merge two DataFrames on the 'Employee\_ID' column using an inner join.
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7. Write a Python code for drawing a histogram of the 'Salary' column in Maplotlib.

import matplotlib.pyplot as plt