Student name:
Course name: Data analytics
Module name: Python
Instructor name: Abhishek
Mark: 100 points
Grade *(Instructors only)*: _____

Python Assignment – II

📌 Part A: Data Types & Basic Operations

1. Write a Python program to check whether a given string is a palindrome, ignoring cases.
2. Write a Python function that takes a list of integers and returns a new list with only the even numbers squared.
3. Write a Python program to find the second largest element in a list without using built-in sort functions.
4. Given a dictionary of student names as keys and their marks as values, write a program to print the name(s) of the student(s) with the highest marks.
5. Write a program to merge two lists into a dictionary where one list contains keys and the other contains values. Handle if their lengths are not equal.

📌 Part B: Strings and List Manipulation

6. Write a Python program to count the frequency of each character in a string and print it as a dictionary.
7. Given a list of words, write a Python function to filter out all words shorter than 5 characters.
8. Write a Python program to find all the unique elements in a list without using the set data type.
9. Write a program to reverse each word in a sentence while maintaining the word order.
10. Given a string containing a mix of letters and numbers, write a program to calculate the sum of all the numbers present in the string.

📌 Part C: Functions

11. Write a Python function to check if a number is prime or not.
12. Write a function that takes a list and returns a new list with the first and last elements swapped.
13. Write a Python function that takes a list of integers and returns the median.

14. Write a program to implement a simple calculator using functions that can perform add, subtract, multiply, and divide, and allow the user to select the operation repeatedly until they choose to exit.

📌 Part D: Algorithm Problems

15. You are given a list containing n distinct numbers from 1 to n+1. Find and return the missing number.
16. Write a function to check if a given string is a palindrome (ignoring case and spaces).
17. Write a program to return a dictionary with the frequency count of each element in a list.
18. Write a function that implements linear search to find if an element exists in a list, returning its index or -1 if not found.

📌 Part E: Additional Function-Based Questions

19. Write a function to calculate the factorial of a given number without using recursion.
20. Write a function that accepts a string and returns the number of vowels in the string.
21. Write a function that accepts a list of integers and returns a tuple containing the sum and average of the list.
22. Write a function that accepts a list and an element, and returns True if the element exists in the list (without using 'in'), else returns False.
23. Write a function to generate and return the Fibonacci series up to n terms as a list.
24. Write a Python program that prompts the user for two numbers and divides them, handling the ZeroDivisionError and ValueError appropriately.
25. Write a Python program to sort a list using bubble sort.