IISER KOLKATA

Indian Institute of Science Education and Research Kolkata

End-Semester Lab Examination-2024 (Autumn Semester): Group-B

Subject: ***Introduction to Computer Programming*** **Subject Code:** ***CS1101***

Full Marks: ***30*** **Time Allotted:** ***3 hours***

Important Instructions: Answer all questions! Create a directory called **endsem** in your home directory. Save all codes in that directory. Write your python codes in files with names "**Qx.py**" where **x** is the question number. There should be 6 python files for the 6 questions. Finally, copy and paste all codes in a single file called **999solutions.py** if your roll number is **24MS999**.

Once you are done writing the programs, **logout from the system (do not power off!).**

Q1. Write a Python program that asks the user to input two numbers and a mathematical operation (+ or – or * or /) to be performed, and shows the result depending on user input. For example: If the input numbers are 66 and 77 and the input operation is +, the output should be 66 + 77 = 143. **(5)**

Q2. Write a Python function, named as ***checkLeapYear***, that takes any year as input argument and checks whether it is a leap year or not. If the input argument is a leap year, the function *returns* ***True***. Otherwise, it *returns* ***False***. Now, write appropriate Python statements to ask the user to enter a year *y* and call the ***checkLeapYear*** function to test the same. **(5)**

Q3. Write a Python program that takes a string as the input from the user and counts the number of vowels and the number of consonants present within the string **(5)**

Q4. Use the concept of nested loop construct to print the following pattern. **(5)**

```
* * * * *
# # # #
* * *
# #
*
```

Q5. Write a Python program that takes any sentence from the user and creates a list of words present in the given sentence. Now, write appropriate Python statements to update the list so that it contains only those words that are longer than length n, where n is also taken from the user. There should be NO repeated words as well. Now, print the final version of the list. **(5)**

Q6. Generate a list of n random numbers, where the numbers should be considered from the range [0,9] and n should be taken as input from the user. Now, write appropriate Python statements to compute the frequency of each distinct number present in the list and plot the same using a bar plot. The plot should have appropriate title and appropriate labels for the x and y axes. **(5)**