Lab-Exam

This is an exam - you have to solve these questions yourselves. Using any help from any source (another person, internet, notes, books, etc) will be construed as "using unfair means". Time is 1.5 hours. Each question is for 2 marks. Instructions:

- You are not allowed to keep cell phones, bags and any books with you. You cannot access the internet or any other resource for answering these questions. You can keep 2 blank sheets and a pen for doing rough work.
- **The exam paper will be released on Google classroom exactly at 4 pm**. You need to download the question paper within the next 5-10 minutes. After that the internet will be disabled and you will no longer be able to access the question paper.
- You need to code on VS code or any other offline editor.
- At the end, you need to create a zipped folder containing all your solution files (.py files) - suggested that you name them q1.py, q2.py, …. The zipped folder must be named as "**Rollno_Name.zip".**
- The internet will be again enabled for 10 minutes, within which you need to upload your zip file on Google Classroom for the assignment titled as "**End Sem Lab Submissions**".
- After that, the internet will be again disabled and you will be allowed to leave the venue. It will be your responsibility to upload and turn-in your submission within the given deadline.
- Any attempt to submit/change/… your submission after the deadline will be treated as "using unfair means" (GC timestamps all submissions/resubmissions/edits, etc.)

1. You are given a list of n elements (hardcode this input list in your program). Create a palindromic list of (2*n)-1 elements. The palindromic list elements will be --> [0th, 1st, 2nd, ..., n-1th, nth, n-1th, ..., 2nd, 1st, 0th]. Where 0th, 1st, ..., nth are the l1's elements. The original list should not be changed. You cannot use the reverse() function on lists for this problem.

2. Given a list of numbers representing the salary offers made to students in IIIT-D. Write a function that returns: median salary, average of salaries of those students whose salary is < than median, average of salaries of those students whose salary is >= median. (Median of a list of numbers is the value such that half the values are below it, and half are above or equal to it; for odd number of items, it is the actual "mid" value; for even number of items, it is a value between the "two mid" values). In the main program you can set the list (hard-code), and print the values returned. You cannot use math or any other libraries.

3. Given a number n, use a list comprehension to find all of the numbers between 1 and n that are divisible by any of the odd numbers between 2 and 10.

4. Given two lists L1 and L2, write a program to create a list of tuples, each tuple having one element from L1 and one from L2. You cannot use any loop or list comprehension for this.

5. Write a function to check if a password (a string) is strong. A password is strong if it contains at least one small letter, at least one Capital letter, at least one digit, and at least one of the following characters: @#$%&, and has a length of at least 8. The function should return True if the password is strong, and False if it is not.

   Samples:
   "Hello123", function should return False
   "Hello@123" -> True
   "12Hel#" -> False

6. Given a file in.txt that contains multiple lines each line containing multiple integers separated by blanks. You have to write a program that outputs a file out.txt which has squares of each of the integers in in.txt - the output file should have the same number of lines and each line the same number of elements (each being a square of the corresponding element in in.txt). Your program cannot use any libraries/packages. An example:

in.txt	out.txt
1 2 3 4	1 2 9 16
5 6	25 36
7 8 9	49 64 81

7. Given a list of integers, and an input integer, find the frequency of occurrence of that integer in the list, and the indices where it is present in the list. You must build a dictionary for this from the given list and then use it to print the frequency for the given integer. (Dictionary is the most efficient way of doing this, if the operation is to be performed many times.) You can assume that list is given to you and you can hard code it. Your program should take the user input for the integer, and then print the answer.

   For l = [1, 1, 2, 2, 1, 3, 2, 4, 5, 2, 6,7,8,9]; and the elt being: 2
   The output should state that: frequency is 4 and indices are 2,3, 6, 9.

8. Create a student class which has attributes rollno (an integer), name (string), and courses, where courses is a dictionary {cno1: grade, cno2: grade, …} where cnos are strings (representing course numbers) and grade is an integer between 2 and 10. When a student object is created, the courses dictionary is empty. Write methods to add a course, add grade for a course, compute the average grade of the student, and print the student record (it should print, rollno, name, list of courses with grades, and the average grade).

   In the main program, create a student with name "stu1" and rollno 23001; then add courses "cs101" and "M101"; then give them grades of 9 and 8; then print the student record. (So, the output of this program is stu1's record)