National University

of Computer & Emerging Sciences Peshawar Campus

Student Name: _____ Roll No: _____

Program: BS(SE)
Semester: Spring-2020
Time Allowed: 02 hour
Course: CS118 – Programming Fundamentals

Examination: Final
Total Marks: **90** Weightage:50%
Date: 13/01/2020
Instructor: Sara Rehmat

Q.No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**Tot.**	**Sign.**
Obtained																									
Marks	3	2	2	4	3	10	3	5	2	3	5	5	4	5	3	2	3	5	5	4	5	5	2	**90**	

NOTE:

- Attempt all questions.

NO ANSWER SHEET REQUIRED

1. In the following program, replace the **for** loop with a **while** loop. **[3 marks]**

```
S = 'I had a cat named Amanda when I was little. '
count = 0
for i in S:
    if i == 'a':
        count += 1
print(count)
```

2. The following Python statement generates this error: 'ValueError: too many values to unpack'. Why?

```
first, second = input('Input two space-separated numbers: ')
```

[2 marks]

3. Write a program that will print "It's a Yes!" if the user inputs 'yes', 'Yes', or 'YES', and will print "It's a No!" otherwise. Use string functions. **[2 marks]**

4. You are creating a new account and need to provide a password. The password has the following requirements. **[4 marks]**

a. The password must be at least 6 characters and at most 20 characters.
b. It must contain at least one lowercase letter, one uppercase letter, and one number.

Write a program that prompts the user to input a password and checks if the password is valid. If the password is valid, print "The password is valid". If it is not, print "The password is invalid".

5. Consider that there is a text file named ‘test.txt’ in the directory where the file containing the following code is placed. **[3 marks]**

```
import os
filename = os.path.join('.', 'test.txt')
f = open(filename, 'r')
print(f.read())
```

Specify what is wrong with this code. How it can be corrected and why is it necessary to correct it?

6. Consider a text file with a paragraph containing some sentences, all of which are lowercased sentences. Read the file, capitalize the first word of every sentence, and write the text to new text file that will contain one sentence on each line. **[10 marks]**

7. Write a program that asks the user to input three numbers. Divide the first number by the second number and add that result to the third number. Use exceptions check for the following errors: **ValueError** and **ZeroDivisionError**. **[3 marks]**

8. Consider a text file containing at most 100 lines of text. Write a program that prompts the user to enter a list of numbers, remove the lines at those numbers, and save the output to a new text file. **[5 marks]**

9. Given `D = {'a':3, 'x':7, 'r':5}`: **[2 marks]**

a. Write Python code that returns the value at key 'x'.

b. Write Python code that returns the key given value 7.

10. Create a dictionary from two strings 'Jack Jim Jose' and 'Guitar Drums Bass', with the names as keys and the instruments as values. **[3 marks]**

11. Consider a file in which every line is of the format: Country, City. Write a Python program to read the file, record the information in a dictionary, and report the number of cities in each country. For example, if the file contains: **[5 marks]**

UK, London
US, Chicago
US, Detroit

The output will be:

UK : 1
US : 2

12. Write a function that takes as an argument an unordered list of integers and returns a dictionary of the three integers with the highest count and their counts. That is, key is integer; value is its count. In case of a tie, either value can be returned. **[5 marks]**

Suppose the input is [4,1,4,2,4,5,1,3,2,1,4,3], the function must return {4:4, 1:3, 2:2} or {4:4, 1:3, 3:2}

13. Consider the following code and write what is printed by each piece of code: **[2+2=4 marks]**

1.
`list1 = [1, 2, 99]`
`list2 = list1`
`list3 = list2`
`list1 = list1.remove(1)`
`print(list3)`
`print(list1)`
	Output (a):

2.
`def foo(list2):`
`  list2.append(3)`
`  print(list2)`
 	
`list1 = [1,2,99]`
`foo(list1)`
`print(list1)`
	Output (b):

14. Given x = [1, 2, 3], write a functions that: **[2.5+2.5 = 5 marks]**

a. Creates a list y such that changing x also changes y
b. Creates a list y such that changing x does not change y.

Write a **test** for each of the functions given above to test whether they are working properly. (**Hint:** assert)

Code for a.	**Code for b.**
Test for a.	**Test for b.**

15. Consider a directory named **code**, this directory contains a python source file named **filehandling.py**. There is a directory inside the **code** directory named **data**, this directory (data) contains a file named **test.txt**. **[1.5+1.5 = 3 marks]**

a. Write the code in **filehandling.py** that accesses the file **test.txt** using relative path.
b. What are the advantages of using relative path over the absolute path?

16. What differentiates a tuple from a list? Be specific. **[2 marks]**

17. Given a list `L = [1,2,3,4],` we want to convert the list to the string `'1234'`.
We tried: `"".join([i for i in L])`, but it does not work. Fix it. [**3 marks**]

18. Write a function that takes a string as an argument, converts the string to a list of characters, sorts the list, converts the list back to a string, and returns the resulting string. Also, write a **test** for this function.

[**2.5+2.5 = 5 marks**]

19. Given a dictionary D, rewrite this code using exceptions: [**5 marks**]

```
if x in D:
    D[x] += 1
else:
    D[x] = 1
```

20. Give reasons for calling Python [**4 marks**]

c. A dynamically typed language
d. A high-level language

21. Write a function that takes a string of words and integers as an argument and returns two lists: one list of the words, the other a list of the integers. You must use exceptions to distribute words and integers to their respective lists. For example, if the parameter string is "Hello 15 2 World", the function should return ["Hello", "World"], [15, 2]. [**5 marks**]

22. Suppose that a text file contains student records on each line and each record is of the format: [**5 marks**]

Name of Student, Student Id, GPA

Write code to read the file line by line and store all the records in lists or tuples (whichever is feasible).

23. What are the pros and cons of using a compiler and an interpreter? [**2 marks**]