	NILE UNIVERSITY OF NIGERIA **FACULTY of NATURAL and APPLIED SCIENCE** **2017/2018 ACADEMIC YEAR** **1st SEMESTER** **EXAMINATION SHEET**	
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Student ID No: **Name:**

Department: COMPUTER SCIENCE **Level: Undergraduate**
Course Title: Problem Solving and Algorithms
Course Code: CSC 102
Lecturer: Dr ADEDOYIN DUROJAIYE/Yusuf Aleshinloye A. **Exam type:FINAL**
Duration: 2 hrs **Date: Jun, 2020**

Answer the Compulsory question in section A and any other 3 in section B.

Section A: Answer ONE question in this section based on your department

Question 1 (25 marks) (Compulsory for Software Engineering Students)

a. Consider the following statements. Explain why some statements fail and correct the errors. In the case of no error give the correct answer.

- x=1; print 'sin(%g)=%g' % (x, sin(x))
- C = A + B; A = 3; B = 2; print C
- C = 21.0; F = 9.*(C/5.0) + 32; print F
- t = (2, 4, 6, 'temp.pdf'); t[1] = 4; print t

b. List and explain three ways of writing import statements in Python?
c. Using examples, explain the difference between lists, tuples and dictionaries.
d. Write a small code to illustrate 'try' and 'except' statements in Python.
e. Write a function for checking the speed of drivers. This function should have one parameter: speed.
If speed is less than 70, it should print "Ok".
Otherwise, for every 5km above the speed limit (70), it should give the driver one demerit point and print the total number of demerit points. For example, if the speed is 80, it should print: "Points: 2". If the driver gets more than 12 points, the function should print: "License suspended"

Question 2 (25 marks) (Compulsory for Computer Science Students)

1111 Nile gave rise to early Egyptian civilization and is still home to the Great Pyramids and Sphinx of Giza near Cairo. Sightseeing boats, from luxury liners to traditional felucca sailboats, also cruise between the cities of Luxor and Aswan.
Use the page above to answer the following:

a. Assume the passage is stored in "Nile.txt". Write a code snippet that will count the number of lines in the passage.
b. How will you count the total number of words in the passage?
c. Write the code snippet that will display on the third line.
d. Write the code snippets that will add a word that begins with the letter "L" to an empty list.

e. Write a code snippet that will display every word that begins with letter c in the passage.

Question 3 (25 marks) (Compulsory for Information Technology Students)

You have just been selected as a member of the Nile University convocation committee. Your task in this committee is to ensure that all the graduation students name as well as other details are reflected on the convocation bulletin. As a student of Information Technology and you have offered Problem Solving and Algorithm module. The chairperson of the committee requested you write a function in python that will help capture the necessary details of the graduating students. The details to be captured are as follows:

a. Name
b. StudentID
c. Department
d. CGPA
e. Age
f. Hobby

Section B: Answer ANY THREE questions from this section

Question 4 (25 marks)

a. A file containing data about a collection of presidents has the following format.

Muhammadu Buhari Nigeria
Donald Trump USA
Emmanuel Macron France
Vladimir Putin Russia

Each line contains a president's name, and country.

Write a complete Python program that will input the contents of the file into a list of tuples, and output full details of the presidents sorted by country (the smallest first) in a neatly formatted table.

The output for the data shown above would be

Emmanuel Macron France
Muhammadu Buhari Nigeria
Vladimir Putin Russia
Donald Trump USA

The filename should be obtained from the user; if the file does not exist the program should terminate after displaying an appropriate message.

b. Complete the code for the following function so it matches its documentation:

```
def doubleList(numberList):
''' For each of the numbers in the list numberList, print a line
containing twice the original number. For example,
doubleList([3, 1, 5]) would print
6
2
10
'''
```

Question 5 (25 marks)

You have just been elected as the president of the computer science student association. The HOD request you help write a python code that will be used at the point of admitting students into the computer science department. The HOD wants you to write a python code that will enable the admission office to capture the wait value for every grade in every perspective Nile student WAEC result. The code should compute the weighted sum and the weighted average for every student separately. The number of subjects per student is unknown to the academic office. The admission office will use the weighted sum and weighted average to determine if a student deserves a scholarship or not.

SNo	Grade	Wait
1	A	5
2	B	4
3	C	3
4	D	2
5	E	1
6	F	0

Question 6 (25 marks)

Write the pseudocode for the following:

a) To find the sum of square root of any three numbers.
b) To find the sum of first 100 integers.
c) To find the sum of all odd numbers till 100.
d) To find the sum of any five integers.
e) To find the factorial of number n.

Question 7 (25 marks)

As a measure to avoid examination malpractices, the University management has instructed all Deen and HOD that the sitting arrangement should follow the "EVEN and ODD" pattern. Consider the last digit of your number, and do the following:

a. What programming paradigm will allow you to split the students based on the arrangement.
b. Define a function to sum all student's last digit in your group.
c. Assume you are to add only even digit to a list. Write at most two lines of code to illustrate this.
d. Write a line of code that helps display the greatest of the even digits in the list in c above.
e. Write a complete function that will determine the greatest of the digits in the group you belong to.
f. The python code presented below is aimed at determining the maximum of even integer numbers that are stored in a list. Complete the code and show the final program output.

Question 8 (25 marks)

You have been asked by the Nigerian Meteorological Agency to write a python program that prints out two lists; with Celsius degrees 0, 10, 20, . . . , 100 in the first list and the corresponding Fahrenheit degrees in the second list. [Hint F = (9.0/5)*C + 32].

i. Using a While loop
ii. Using a For loop
iii. By defining a function that accepts a value for the Celsius degree (via keyboard) and returns the corresponding Fahrenheit value
iv. Create a dictionary with Celsius values as key and their corresponding Fahrenheit as value. Print out the contents of the dictionary
v. The head of the agency wants to check for warnings any time by providing a value in Celsius (via keyboard). The condition to be checked is that any temperature (now in Fahrenheit) over 90 degrees and lower than 30 degrees will cause a hot and cold weather warning, respectively. Provide python codes for this check and print the corresponding warning.

Question 9 (25 marks)

You are a participant at the National Mathematical Programming competition at Abuja. You are presented with a file that contains the CGPA of all state representatives. You are to do the following on the file:

a. It was discovered that the CGPA of FCT was not included in the file. Write at most two lines of code that will allow you to append a new CGPA to the file.
b. Write a for loop code that to count the number of CGPA in the file.
c. Write one line of code that will allow you to compute the average CGPA in python.
d. Define an output file for your responses in b and c above.
e. Write a line of code that will output the count and the average CGPA you computed in b and c above.