PRG1	**Programming I** Diploma in CSF / IT / FI / CICTP Year 1 (2019/20) Semester 1	Week **6** 60 minutes
Programming Aptitude Test 1 (15 %)		
Name:	**Student No.:**	**Class:**

Instructions

Prior to test

- Create a folder on your desktop with your student id as the name
- Create 3 python files in that folder with the following naming convention
  a. Q1_S12345678.py
  b. Q2_S12345678.py
  c. Q3_S12345678.py
- In each file, enter your **name**, **id** and **group** in the first line as comment:
  e.g. *# John Tan (S12345678) – IT01*

Submission

- Compress the folder containing the 3 python files into a **.zip** file

1. ***MeL***
   PRG1 > Assessment > Aptitude Test 1
   - *Upload **.zip** file and "Submit"*
   - *No other compression formats are allowed.*
2. ***Network folder***
   \\ictspace.ict.np.edu.sg\PRG1\<Pxx>\<StudentID>
   - Create a folder 'Aptitude Test 1'
   - *Upload **.zip** file*

Note: It is **your RESPONSIBILITY** to ensure that the files are submitted correctly

1 Before offering a loan, banks gather a lot of information about the borrower. This information often includes the loan amount, annual income, total savings, current loans, and number of years to pay back the loan. The bank then uses this information to calculate a monthly interest based on the following formula:

$$Interest\ Rate = \frac{L + C}{S + A \times Y}$$

$loan\ amount = L$
$annual\ income = A$
$current\ loans = C$
$total\ savings\ = S$
$years\ to\ pay\ back\ loan = Y$

Write a Python program that prompts the user for all of this information, and prints out a message with their interest rate to one decimal place (E.g. 'Your interest rate is 2.5%')

(4 marks)

2 Write a Python program that asks a 40-year-old user how many children he has, and calculates the minimum and maximum number of great grandchildren he could have. Assume that each child will have 1-4 children.

Sample Run:

```
How many children do you have? 1
User with 1 children will have at least : 1 great grandchildren
and at the most: 16 great grandchildren
```

(4 marks)

3 The last alphabet of a Singapore vehicle plate number serves as a means to check if a vehicle plate number provided is valid.

To validate a given vehicle plate number with 4 digits starting with 'S', do the following:

- Ignore the letter 'S'
- Assign a number to the letters as follows: A=1, B=2, C=3, …etc. For the number plate SBA 1234, this is converted to 21 1234
- The 6 individual numbers needs to be multiplied by 9,4,5,4,3,2 respectively and added together. For the example above, we will get, 2 x **9** + 1 x **4** + 1 x **5** + 2 x **4** + 3 x **3** + 4 x **2** = **52**
- This value is divided by 19 to obtain the remainder. For the example above, **52** % 19 = 14
- Use the remainder to locate the character at this position in the following reference string, "AZYXUTSRPMLKJHGEDCB". In the above example, character at position 14 is 'G'.
- This should be the last character of the vehicle number plate

Write a Python program that prompts the user to enter a Singapore vehicle plate number with 4 digits starting with 'S', and displays the validity of the given vehicle number.

The following shows a sample run of the program. The input value is underlined.

```
Enter the vehicle number to be validated: SBA1234K
Validity of the vehicle number: Invalid

Enter the vehicle number to be validated: SBA1234G
Validity of the vehicle number: Valid
```

You may use the code below or any other ways to map a letter to a number based on A=1, B=2, C=3, …etc.

```
# For example. assume the character in question is "b"
char="b"
num=ord(char.upper())-ord("A")+1
```

(7 marks)

PLAGIARISM WARNING:

If a student is found to have submitted work not done by him/her, he/she will not be awarded any marks for this practical test. Disciplinary action may also be taken.

Similar action will be taken for student who allows other student(s) to copy his/her work, or posting any solutions or code related to the practical test before the end of the hour for the test.

*** END OF PAPER ***