5th Year

Computer Science

Sections C

Higher Level

1 Hour

Question	Marks
16a	
16b	
16c	
16d	
Total	

Instructions

Answer all parts of the question on your digital device.
Calculators may be used during this section of the examination.
The *Formulae and Tables* booklet cannot be used for this section of the examination.
You will be given a copy of the *Python Reference Guide*.
Ensure that you save your work regularly and when you complete each question part.
Save your file using this naming structure:
You will be given a file named: name_q16.py
Replace the word "name" with your name e.g. JohnSmith_q16.py

Write your name in line 1 of the code also.

Note that sample inputs and outputs are given in the questions below.

If you are unable to get some code to work correctly, you can comment out the code so that you can proceed. The code that has been commented out will be reviewed by the examiner.
Rough work pages are provided at the end of this booklet. Please note that this booklet is not to be handed up and will **not** be reviewed by an examiner.
At the end of the examination it is your responsibility to ensure that you have saved all of your files onto your external media.

Question 16

Part a)

Open the file name_q16.py using Thonny. Add your name to line 1

You should see the code below.

This is a piece of code that defines a list of lowercase vowels and asks the user to type in a word.

```
1 # Paper C Summer Exam 5th year
2 # Student name: _______
3 # Analyse a word input by the user
4 # Part a)
5
6 vowels=['a','e','i','o','u']
7
8 word = input("Please type in a word : ")
```

i) Place a sentence before line 8 explaining the code will count the vowels in the word entered. Your output should look like this.

```
This program will count the vowels in the word you enter
Please type in a word : education
```

ii) Now change the code so that it counts the total number of vowels in the word entered. Sample output should look like this.

```
This program will count the vowels in the word you enter
Please type in a word : education
The word education contains 5 vowels
```

iii) Now edit the code so that it checks that all characters in the code are letters a-z. Print an error message if the user enters invalid input. You do not need to put this inside a loop – if invalid input is entered, the program will print the message below and end.

```
This program will count the vowels in the word you enter
Please type in a word : educ8tion
You can use only letters a-z
```

iv) Now add a calculation to see how many consonants are in the word. Print this information below the number of vowels.

```
This program will count the vowels in the word you enter
Please type in a word : computer
The word computer contains 3 vowels
It contains 5 consonants
```

v) Finally change the code so that it isn't case sensitive. Sample output below.

```
This program will count the vowels in the word you enter
Please type in a word : Education
The word Education contains 5 vowels
It contains 4 consonants
>>> %Run '5th Year Summer Exam 2023 solution.py'
This program will count the vowels in the word you enter
Please type in a word : EDUCATION
The word EDUCATION contains 5 vowels
It contains 4 consonants
```

Now save your code and open the code provide for part b.

Part b)

This code imports the random library and then chooses a random integer between 1 and 6 (ie it simulates a diceroll), and prompts the user to guess what was rolled.

When working with random numbers, your output will probably look different to what is shown here. For testing purposes, you may need to comment out the randint() call and hardcode the diceroll OR temporarily print the diceroll result to the console so that you can test guessing correctly and guessing incorrectly.

```
1  # Paper C Summer Exam 5th year
2  # Student name: _______
3  # Guessing Game
4  # Part b)
5
6  import random
7
8  diceRoll=random.randint(1,6)
9
10 diceGuess = input("Guess which number was rolled")
```

i) Before line 10, insert a line that says that the dice are being rolled. Your output should look like this.

```
The die is being rolled ...
Guess which number was rolled
```

ii) The user will enter a number and your code will check if it matches the random diceroll generated by the python code. Your output may look like this. Two runs of the code are shown below.

```
>>> %Run '5th Year Summer Exam 2023 q16b solution.py'
The die is being rolled ...
Guess which number was rolled3
Incorrect !
>>> %Run '5th Year Summer Exam 2023 q16b solution.py'
The die is being rolled ...
Guess which number was rolled2
Correct !
```

iii) Now set up a loop so that the user will be asked to guess a dice roll multiple times. You should code it so that when the user enters a number >6 the program will end with "Thanks for playing"

```
The die is being rolled ...
Guess which number was rolled 6
Incorrect !
The die is being rolled ...
Guess which number was rolled 7
Thanks for playing
```

iv) Now you need to store the dicerolls and guesses in two lists. Initialise two empty lists in your code and insert a comment. The lists should be called diceRollList and guessList.

v) Inside your loop, add the diceRoll generated by randint() to the diceRollList and add the user's guess to guessList. Once the user has hit a number greater than 6 to stop guessing, the two lists should be printed. After several rounds of guessing a table like this should be shown.

```
Thanks for playing
Dice rolls   : [5, 2, 4, 4, 6, 4, 1, 2, 4, 4, 6, 6, 6]
Your guesses : [5, 4, 5, 3, 2, 6, 3, 1, 2, 4, 6, 1, 7]
```

vi) Now analyse both lists and count how many times the user guessed correctly and express this as a percentage of total guesses.
[For example, if the user guessed correctly 3 times out of 11, you would calculate (3/11) x 100 % and round to 2 decimal places.

```
Thanks for playing
Dice rolls   : [6, 2, 3, 1, 1, 2, 2, 6, 4, 2, 2, 3, 4, 5]
Your guesses : [3, 2, 4, 3, 4, 6, 5, 3, 4, 2, 3, 5, 6, 7]
You were correct in 21.43 % of guesses
```

vii) The last item in the lists above shouldn't be counted, since the user wasn't guessing. Remove the last element from each list so that the final user guess seen will be a valid number from 1 to 6.

```
The die is being rolled ...
Guess which number was rolled 5
Incorrect !
The die is being rolled ...
Guess which number was rolled 7
Thanks for playing
Dice rolls   : [3, 4, 3, 4, 6, 6, 4, 6, 1, 2, 5, 3, 4]
Your guesses : [4, 5, 3, 6, 4, 2, 5, 4, 2, 3, 1, 6, 5]
You were correct in 7.69 % of guesses
```

Save your file. Ensure that you have saved your file and renamed it correctly before you finish the exam.

Space for rough work.

This page will not be reviewed by an examiner.