2020. M109C

2020L219G2EL

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2020

Computer Science

Section C

Ordinary Level

1 hour

80 marks

Instructions

There is one section in this paper.

Section C	Programming	80 marks	1 question

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.

The Superintendent will give you a copy of the *Python Reference Guide*.

Ensure that you save your work regularly and when you complete each question part.

Save your files using the naming structure described at the beginning of each question part.

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.

You will be provided with a brown envelope for your external media. Write your examination number on this envelope and place your external media into it before sealing. Place this envelope in the pouch at the front of the red envelope that contains your examination booklet from Section A and B.

Do not hand this paper up

Section C Programming 80 marks

Answer all question parts.

Question 16

(a) Open the program called **Question16_A.py** from your device. The source code is shown and described briefly below.

Before making any changes, you should use the format **CandidateNumberQuestion16_A.py** to save your file. For example, if your candidate number was 123456 you would save the file as **123456Question16_A.py**.

Enter your Examination Number in the space provided on **Line 2.**

The program below picks a random number between 1 and 10 and then invites the user to guess the number. The program informs the user if their guess is correct or incorrect.

```
1  # Question 16(a)
2  # Examination Number:
3
4  import random
5  x = random.randint(1,10)
6
7  guess = int(input("Guess what number I have chosen: "))
8
9  if guess == x:
10     print("Your guess was correct.")
11 else:
12     print("Your guess was incorrect.")
```

Make the following changes to the program:

(i) Insert a comment to say *'accept user input'* in the appropriate location in the program.

(ii) Change the output to tell the user that they are a winner if their guess was correct.

When the program is run the output may look as follows:

```
You are a winner.
```

(iii) Change the output to tell the user that they did not win if their guess was incorrect and tell them what the correct number was.

When the program is run the output may look as follows:

```
You didn't win. The correct number is 1.
```

(iv) Change the output so that the user is told if their guess was too high or too low.

When the program is run the output may look as follows:

```
You didn't win. The correct number is 2.
Your guess was too high.
```

(v) Currently the program picks a number between 1 and 10 which only gives the user a 1-in-10 chance of being correct. Change the program to randomly select either the number 1 or the number 2 so that the chances of winning are better.

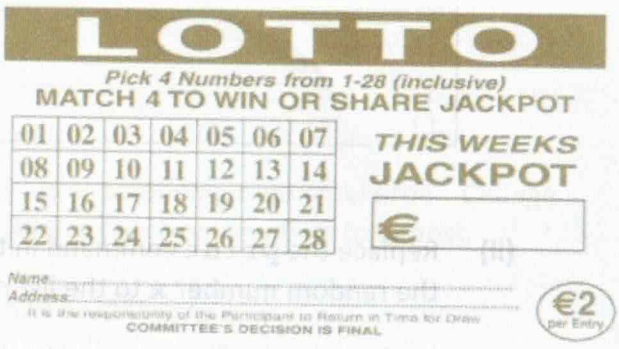
Use the format **CandidateNumberQuestion16_A.py** to save your file. For example, if your candidate number was 123456 you would save the file as **123456Question16_A.py.**

(b) Open the program called **Question16_B.py** from your device. The source code is shown and described briefly below.

Before making any changes, you should use the format **CandidateNumberQuestion16_B.py** to save your file. For example, if your candidate number was 123456 you would save the file as **123456Question16_B.py**.

Enter your Examination Number in the space provided on **Line 2.**

You have been asked to write a simple lottery program that could be used by a sports club to raise funds. An image of an example lottery ticket is shown opposite.



The program below is a starting point and prints three random numbers from 1 to 4 and also prints an empty list.

```
1  # Question 16(b)
2  # Examination Number:
3
4  import random
5  listOfLotteryNumbers = []
6  chosen = 0
7
8  while chosen < 3 :
9      x = random.randint(1,4)
10     print(x)
11     chosen +=1
12
13 print(listOfLotteryNumbers)
```

When the program is run the output may look as follows:

```
1
4
3
[]
```

Make the following changes to the program:

(i) Print a message to the screen stating that the printed numbers are this week's lottery numbers.

When the program is run the output may look as follows:

```
This week's lottery numbers are:
1
4
3
[]
```

(ii) Replace the **`print`** command in the **`while`** loop with the **`append`** method to add the random number **`x`** to the list named **`listOfLotteryNumbers`**.

When the program is run the output may look as follows:

```
This week's lottery numbers are:
[4, 4, 2]
```

(iii) The program currently selects **three** random numbers from 1 to 4. Modify the program to select **four** random numbers.

When the program is run the output may look as follows:

```
This week's lottery numbers are:
[4, 1, 3, 2]
```

(iv) The program currently only selects numbers from 1 to 4. Modify the program to select random numbers from 1 to 28.

When the program is run the output may look as follows:

```
This week's lottery numbers are:
[14, 5, 16, 2]
```

(v) When run, this program may select duplicate lottery numbers. Modify the program so that only unique numbers are appended to the list **`listOfLotteryNumbers`**.

Hint: Your program should check that the new random number is not already in the list before adding it and increasing the **`chosen`** variable by 1.

When the program is run the output may look as follows:

```
This week's lottery numbers are:
[23, 4, 12, 17]
```

(vi) The user would like to see the lottery numbers in ascending numerical order. Change the program so that the numbers are printed in order from smallest to largest.

When the program is run the output may look as follows:

```
This week's lottery numbers are:
[4, 12, 17, 23]
```

Use the format **CandidateNumberQuestion16_B.py** to save your file. For example, if your candidate number was 123456 you would save the file as **123456Question16_B.py**.

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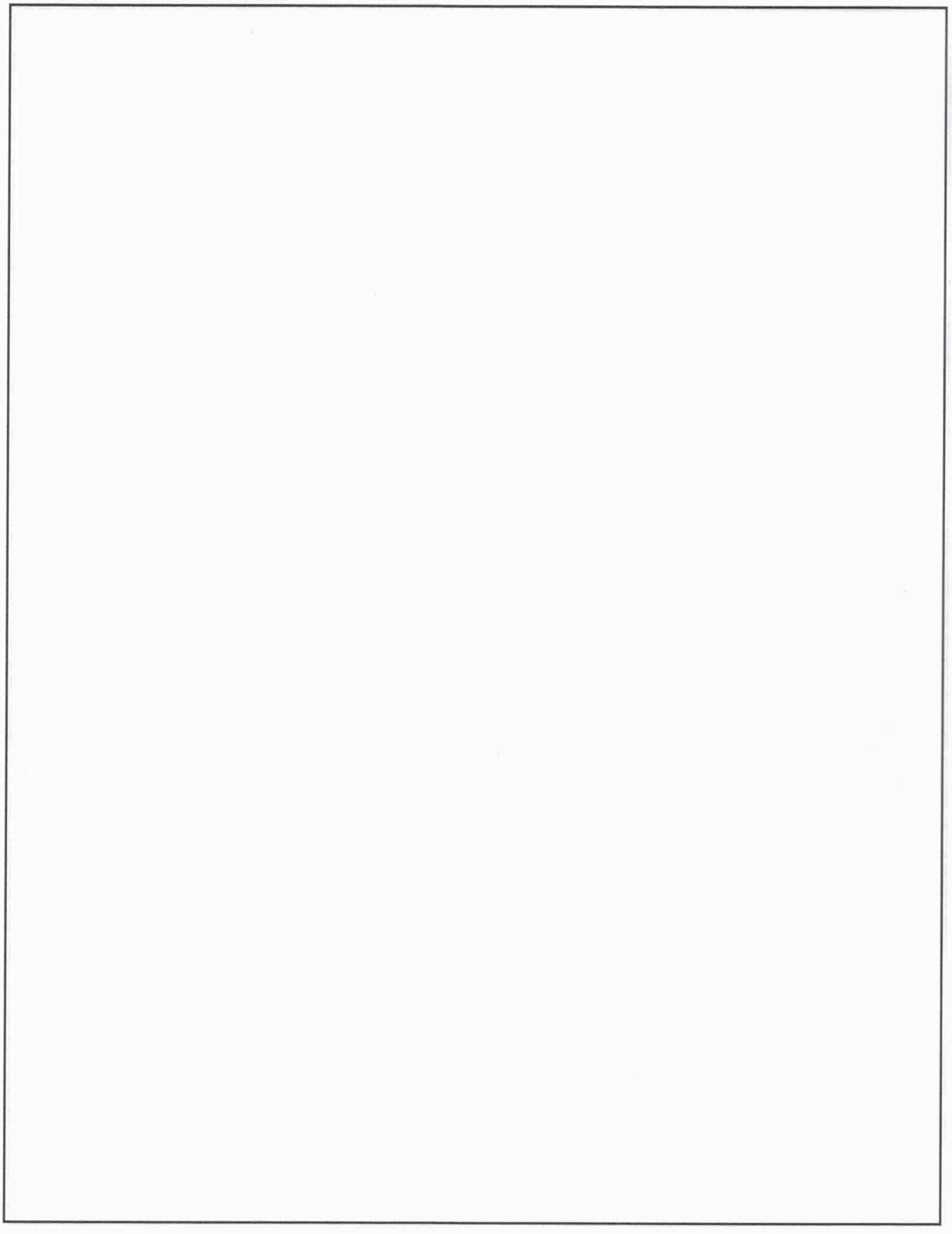

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Acknowledgements

Images
Image on page 5: www.carrickemmets.com/index.php/14-club-lotto/1-club-lotto-results

Leaving Certificate – Ordinary Level

Computer Science – Section C

1 hour