

## LEAVING CERTIFICATE EXAMINATION

# Computer Science

### Instructions to Computer Science Teachers

The first Leaving Certificate Computer Science examination is scheduled to take place in May 2020. The final examination component of Leaving Certificate Computer Science will be a combined practical and written examination. The examination will comprise of the following, in order:

- A. 1 hour 30 minutes paper-based element
- B. 1 hour computer-based element

The paper-based element will take place in a room that the school will set up as a standard examination centre, similar to the arrangement that currently applies to the LCVP link modules examination. The computer-based element can take place in the same centre using portable electronic devices or alternatively in a computer room.

A 30 minute break is scheduled between the two elements. This will allow for movement of candidates to a computer room if required or for set up of the portable electronic devices in the same centre. It will also give candidates time to ensure that their portable electronic device is powered on and working in advance of the computer-based element.

The following set of instructions needs to be undertaken by Computer Science teacher(s) in advance of running the Leaving Certificate Computer Science examination.

#### 1. Exam Centre Set Up

Schools can use separate examination centres for the computer-based element and paper-based element. Where a computer laboratory is being used for the computer-based element of the examination, consideration should be given to spacing between candidates to prevent plagiarism. If candidates are using portable devices, such as laptops, for the computer-based element, then these must not be accessible by the candidates during the paper-based element.

Please note that, as the integrity of the examination requires that it happen at the same time for all candidates, it will be necessary to provide simultaneous access to desktop or laptop computers for all candidates in the school.

It will be necessary to have three external storage devices (e.g. USB flash drives). These will be used at the end of the examination to store candidates' work. Two devices will be submitted to the SEC, along with the examination papers. One of these will contain all the files of the Ordinary level candidates and the other will contain the files of the Higher level candidates. These two devices should be labelled **Higher level** and **Ordinary level**, along with the school roll number. The third device should be used to store all candidate files and is to be retained by the school as a backup. In preparation for the examination, two folders should be created on the external device being retained by the school – one named **Higher level** and the other named **Ordinary level**.

The examination centre set up for the paper-based element should be similar to the arrangement that currently applies to the LCVP link modules examination

## 2. Candidate Device Set Up

It will be necessary to set up individual candidate devices prior to the examination taking place. It may be possible for schools to set up temporary candidate profiles for the exam if required. Schools need to ensure the following in advance of the examination:

1. The candidate device cannot access the internet.
2. The candidate device cannot access files or folders from the school network, other than the files for the examination itself.
3. No files relating to computer science that could potentially benefit a candidate are on the local device.
4. Automatic updates are temporarily disabled for all devices. This is to prevent any automatic restarts during the examination.

Both the device and the desk need to be labelled with the candidate number<sup>1</sup>. As candidate numbers will not be issued in advance of the trial, schools are asked to assign temporary candidate numbers using the system outlined in **Appendix 1**.

The candidate device must have an Integrated Development Environment (IDE) installed locally. This IDE must have a Python compiler. The criteria for such IDEs are laid out in **Circular S55/19**, as published by the State Examinations Commission (SEC), and included here as **Appendix 2**. The Python file type .py must be associated with this IDE. Therefore, when a candidate double clicks on a Python (.py) file it should open in an IDE that meets the criteria set out by SEC.

SEC will send an external storage device to the school to arrive at least three days in advance of the examination. This device will contain two separate folders – one for the Higher level examination and one for the Ordinary level examination. In order to set up each candidate's device correctly for the examination, schools must do the following for each candidate:

1. Copy the relevant Higher level or Ordinary level folder from the external storage device onto the candidate's device.
2. Rename the folder using the following format: **YearCSCBECandidateNumberLevel**.  
For example, a candidate with the examination number 18012, sitting the Ordinary level Computer Science exam in May 2020 should have a folder on the desktop on their device named **2020CSCBE18012OL**. For the trial, schools can use the year 2019 e.g. **2019CSCBE18012OL**
3. In the candidate folder, double-click on the Python file **test.py**. Ensure that the file opens in an IDE that meets the prescribed criteria. Run this test file to ensure that the compiler is working correctly. If there are any problems in opening the files then troubleshoot the issue and rectify as appropriate. This is an important step to ensure that the candidate will be able to open and compile Python code in an appropriate IDE.  
**Note that no other files should be opened.**
4. A number of backup devices should be made available. The external storage device supplied by the SEC should also be available in order to copy over the Higher level files or Ordinary level files required in the event of contingency measures being implemented.

---

<sup>1</sup> Such labels need not be used for the trial.

Access to these devices is not permitted in advance of the examination once they have been set up as described.

### **3. Procedures to be followed between the Paper-Based and Computer-Based elements**

Candidates will finish the paper-based element of the examination at 11:00 a.m. The computer-based element will start at 11:30 a.m. The intervening time should be used to ensure that candidates can move to an alternative centre (such as a computer room) if required and that their device is powered on. If candidates are remaining in the same centre, the time should be used to set up the portable devices. The Computer Science teacher will need to be present to deal with any issues that arise.

The external storage device supplied by SEC, containing the necessary folders for the examination, should be available in the room in the event that any candidate decides to change level.

There should be a bank of devices powered on in the event that they are needed should any contingency matter arise (see **Section 5**).

### **4. Procedures to be followed after the Computer-Based Element**

It is essential that the Computer Science teacher is available immediately after the computer-based element to assist the superintendent with collating the candidates' work onto the external storage devices.

The examination centre should have two external storage devices available.

The following steps should be followed:

- 1.** Beginning with the Higher level candidates
  - a. On the candidate device, ensure that all files have been closed and saved.
  - b. Copy the candidate folder, which is named according to the convention above, onto the external storage device that is to be used for the Higher level candidates. This external storage device should have a label with **Higher level** and the school roll number on it.
  - c. Complete steps **a** and **b** for each Higher level candidate.
- 2.** Repeat step **1** for the Ordinary level candidates; this time using the external storage device that is to be used for Ordinary level candidates.
- 3.** Copy all of the files from both the Higher level and Ordinary level external storage device onto the backup external storage device. This backup external storage device is to be retained in a secure location in the school until the appeals process<sup>2</sup> has been completed.
- 4.** Both the Higher level and Ordinary external storage devices should be given to the Superintendent to be placed in the appropriate envelopes that have been supplied by the SEC.
- 5.** All files relating to the examination can now be removed from the candidate devices.

---

<sup>2</sup> As there is no appeals process for the trial schools can retain the candidates work and use it to support their learning if appropriate.

## 5. Contingency Measures

It is important that contingency measures are put in place in the event of a device failure or power failure in the school. Each centre needs to ensure that there are a number of extra devices available on the day of the examination. These devices should be powered on during the computer-based element. If a candidate loses time due to any of the events detailed below, adequate time to make up for the time lost should be made available at the end of the examination. SEC should be contacted<sup>3</sup> in the event of any such problem arising.

### a) Individual device - crash or failure

In the event of being called upon by an attendant due an individual device restarting or crashing during the examination the following steps should be carried out:

1. Visit the centre and assist the candidate with restarting the device.
2. If the device can be restarted determine if any work has been lost.
3. Inform the superintendent what time the candidate recommenced their examination at and whether or not any note needs to be recorded about work being lost.
4. If the device cannot be restarted the candidate should be moved to an alternative device. The candidate should start on the next question part. The superintendent needs to note when the candidate recommenced their work. The superintendent will allow extra time for that candidate to complete their exam.
5. At the end of the examination efforts should be made to recover candidate work from the devices that they used and these should be collated in the candidate folder on the external storage device
6. At the end of the examination assist the superintendent to record details of any contingency measure that was implemented, including the specifics of device failure and any work that may have been lost. This report should be submitted to SEC.

### b) Centre power failure

If there is a power failure in the centre prior to the examination and no information is available on the restoration of power then candidates should be instructed to complete the examination using pen and paper. The superintendent has been supplied with answer books. SEC should be contacted immediately.

If there is a power failure during the examination candidates should be instructed to complete the examination by writing their answers on the answer booklets. Candidates should continue on the next question part. When power is restored attempts should be made to recover the work that candidates completed on the device and that should be submitted along with the written work for each candidate. SEC should be contacted immediately.

Details of any power failure and contingency measures put in place should be recorded in a report and submitted to SEC.

---

<sup>3</sup> SEC do not need to be contacted if this occurs during the trial. Please provide any details in the feedback form supplied with the sample papers.

## Appendix 1

As candidates will not have been issued their SEC candidate number in advance of the trial schools are asked to use the following system for providing candidate numbers:

Candidate numbers are to consist of a school code followed by a unique number. The school codes are list in the table below and should be followed by an incremental numbering system starting with 001. For example the first candidate from Rice College would have the candidate number **18001** and the twelfth candidate from Castleblayeny College would have the candidate number **31012**.

School Code	School Name	Roll Number
01	Dominican College Sion Hill	60070K
02	Coláiste Bríde	60122D
03	Colaiste Phadraig	60264A
04	St Joseph's Secondary School	60343T
05	Synge St CBS	60470D
06	Terenure College	60570H
07	Loreto College Swords	60810B
08	Stratford College	61020A
09	Clongowes Wood College	61720F
10	Sacred Heart Secondary School	62170B
11	Gaelcholaiste Mhuire AG	62531H
12	Christ King Girls Secondary School	62692I
13	Saint Eunan's College	62830R
14	St Brigids Mercy Secondary School Tuam	63160D
15	Coláiste Mhuire	63270K
16	St Mary's CBS	63560T
17	St Vincent's Secondary School	63900R
18	Rice College	64700O
19	Mount Sion CBS	64930I
20	Presentation Secondary school	65340P
21	Le Chéile Secondary School	86083N
22	St. Finian's Community College, Swords	70120F
23	Breifne College	70380I
24	Coláiste na Ríochta	70500P
25	Ennistymon Vocational School	70840Q
26	Colaiste an Chraoibhin	70990M
27	Coláiste Choilm	71103K
28	Abbey Vocational School	71180F
29	Bush Post Primary	71750U
30	Coláiste Chiaráin	71840V
31	Castleblayney College	72190N
32	Adamstown Community College	76097U

33	Coláiste Pobail Setanta	76098W
34	Creagh College	76127D
35	Luttrellstown Community College	76130P
36	Mount Temple Comprehensive	81002K
37	St Aidan's Comprehensive School	81005Q
38	Carrigaline Community School	91388S
39	Mayfield Community School	91400F
40	Moate Community School	91501L

## Appendix 2

The criteria for the integrated development environment (IDE) that can be used for the computer-based element of the examination are set out below:

It should

- be an offline Python editor
- compile Python 3 code
- have the Python Standard Library preinstalled
- allow for syntax highlighting and auto-indentation.

It can

- include a debugger or “step” functionality
- include variable scope highlighting
- include tab auto code-completion.

It should not

- include advanced intelligent code completion features such as parameter information (e.g. “Intellisense”, “quick info”)

Two IDEs that meet the criteria are *Thonny* and *IDLE*. Examples of IDEs that do not meet the criteria are *PyCharm* and *Visual Studio* (as they have parameter information) and *CoLab* and *repl.it* (as they are not available offline). Any IDE that meets the requirements listed above is permissible. If teachers are unsure as to whether a particular IDE not referred to in this appendix complies with the above requirements, they should seek the advice of the SEC by emailing [practicals@examinations.ie](mailto:practicals@examinations.ie).

Please note that, for the 2020 examination, students will not be permitted to make use of third-party libraries or packages such as *Matplotlib*, *Pandas*, *PyGame*, etc. It is recognised that the modules from the Python standard library remain available. Where appropriate, individual questions will make clear whether commands from such modules may be used.