

# iGCSE Computer Science Revision Notes

## Paper 1

### Exam Technique

#### Know what the examiners can ask you questions about

Have a look at the [IGCSE Computer Science syllabus](#) that you have been studying and are going to be taking the exam for. The list of topics will make a great checklist for your revision. If you find something that you don't understand or haven't made any notes about, then find out about it. *Anything* that is mentioned in the syllabus could be used in an examination question.

#### Read and understand examination questions

What are you being asked to do?

1. Read the question
2. Understand the type of instruction you are being given: Complete, Describe, Draw, Explain, Give and State all require different actions.
3. If the question makes use of a specific scenario or context then make sure that all of your answers are relevant to that context. For example, if the question is about security measures for an offline device, then using an internet-based firewall would not be appropriate!
4. Decide on the information required but remember that you are sitting an iGCSE examination and most answers will require more than just a single word. If you have finished well before the time allotted, you may well have fallen into this trap.
5. Always use correct technical terms and avoid the use of trade names. For example, talk about the use of an operating system rather than the use of 'Windows 10'.
6. Decide how much information is required to fulfil the number of marks available and if in doubt, add more!

#### Help the examiner help you!

- Make sure your answers are easy to read (if in doubt, write it again, clearer!).
- Read through the entire question before you start to answer it, give yourself thinking time and decide how you will format your answer before writing.
- Make it easy for the examiner to see where he/she should give you the marks. This also helps you make sure that you will gain every mark available.
- Answer every question! There is no point leaving blank spaces, you will not lose marks for incorrect answers, so you may as well have a guess.

**d) show understanding of the reasons for choosing serial or parallel data transmission**

**Serial** data transmission is slower than parallel, but is good for long distances as the data cannot become skewed.

**Parallel** data transmission is faster than serial, but data can become skewed over long distances (so is more suitable for short distances)

**e) show understanding of the need to check for errors**

Data transmission is susceptible to interference. This can be electrical, environmental, physical, magnetic etc. Interference will cause data to become skewed and not arrive in the correct order, or for some data to not arrive at all. This is why we must check that data transmission was successful using an error checking method.

**f) explain how parity bits are used for error detection**

A parity bit is added to data to give it even or odd parity. It is usually added at the beginning or at the end of the data, or each byte of data. See 1.1.3 b).

**g) show understanding of the use of serial and parallel data transmission, in Universal Serial Bus (USB) and Integrated Circuit (IC)**

As its name suggests, USB uses serial data transmission, an IC normally uses parallel data transmission.

## 1.2.2 Security Aspects

**a) show understanding of the security aspects of using the Internet and understand what methods are available to help minimise the risks****Firewalls**

Firewalls can help stop unauthorised access from the internet by examining the traffic between a user's computer or local network and a public network (e.g. the internet).

A firewall:

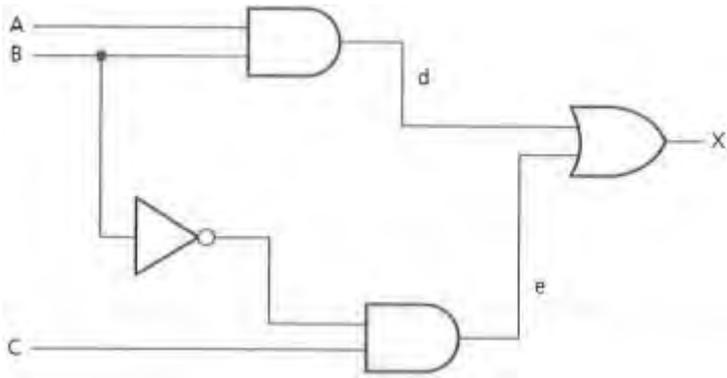
- Monitors incoming and outgoing traffic on a network
- Checks whether incoming and outgoing traffic meet certain criteria, if data fails criteria, the firewall blocks the traffic and warns the user
- can log all incoming and outgoing traffic
- Criteria can be set to prevent access to certain websites, this can be done by the firewall keeping a list of all undesirable IP addresses (a blacklist)
- Warns the user if the software tries to access an external data source

**b) show understanding of the Internet risks associated with malware, including viruses, spyware and hacking****Hacking**

### e) Produce truth tables for given logic circuits.

If you are asked to do this you will be given a space to show your working. It is a good idea to annotate the circuit adding in some locations where you will work out the intermediate answers before you evaluate your overall answer.

An example might be: The student has added in locations d and e to help them work out the overall answer.



With the truth table:

Inputs			Working		Output
A	B	C	D	E	X
0	0	0	0	0	0
0	0	1	0	1	1
0	1	0	0	0	0
0	1	1	0	0	0
1	0	0	0	0	0
1	0	1	0	1	1
1	1	0	1	0	1
1	1	1	1	0	1

### f) Produce a logic circuit to solve a given problem or to implement a given written logic statement.

This is perhaps one of the hardest things you will be asked to do. It is useful to annotate the question (particularly if it is quite wordy) highlighting the keywords such as AND, OR, NOT. It is also worth annotating what value is meant by the wording in the question (for example it might say “if the temperature is over 25 degrees” in logic terms, this means something like  $T=1$ ).

### 1.4.3

- a) show understanding of the need to keep online systems safe from attacks including denial of service attacks, phishing, pharming**

A denial of service attack is an attempt at preventing users from accessing part of a network, usually internet servers. They can prevent users from accessing certain websites or accessing online services. This is achieved by the attacker flooding the network with useless traffic. For example, sending thousands of requests to a website or sending out thousands of spam emails to users 'clogging up a system'.

Other definitions can be found in 1.2.2

### 1.4.4

- a) describe how the knowledge from 1.4.1, 1.4.2 and 1.4.3 can be applied to real-life scenarios including, for example, online banking, shopping**

Make sure your answers to this sort of question relate directly to the context of the question. For example, don't mention internet security if the system in question is offline.

## 1.5 Ethics

- a) Show understanding of computer ethics, including copyright issues and plagiarism.**

Computer ethics is a set of principles set out to regulate the use of computers to stop unethical things from happening. Copyright is a system to prevent somebody from copying something without permission. Plagiarism is the act of copying somebody's work and claiming it is your own.

- b) distinguish between free software, freeware and shareware**

Free software - Users have the freedom to run, copy, change or adapt the software.

Freeware - Users can download free of charge, but it is subject to copyright laws so the user cannot copy, change or adapt the software.

Shareware - Users are allowed to try out shareware free for a trial period. At the end of this period, the user will be requested to pay a few. Sometimes the trial version does not have all of the features of the full version.

- c) show understanding of the ethical issues raised by the spread of electronic communication and computer systems, including hacking, cracking and production of malware**

Ethical issues include:

- Privacy - should authorities be able to see our personal data?
- Digital ownership - copyright and open source
- Data gathering - CCTV and other monitoring methods
- Access costs - should the internet be free?
- Ethical hacking - is hacking ever good?