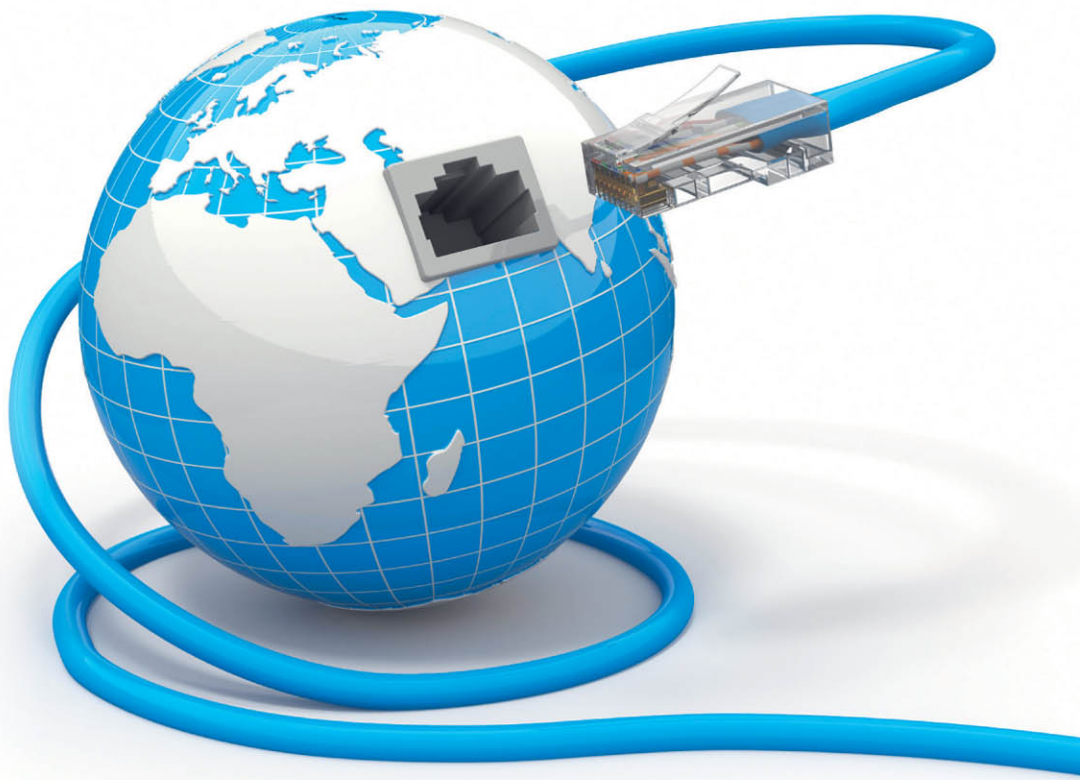
my revision notes

Cambridge Technicals Level 3

IT



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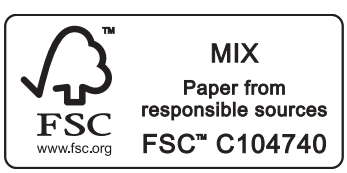

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Get the most from this book

Everyone has a different approach to how they revise and, in particular, what works for them. Whatever method you use, it is always important that you review your work, learn it and then put your knowledge and understanding to the test.

These revision notes will guide you through the examinable units, helping you to ensure that you have covered all of the teaching content in sufficient depth. As IT is always changing, there are some sections where you may be asked to complete the information for yourself based on the notes from the lessons you have attended with your teachers.

After the sections on the content of the units, you will find a section on exam techniques. It is important that you study this section also: it will not matter how much you have learnt if you cannot apply that knowledge and understanding in an exam situation. After this, there is a glossary of terms that will help you refer to some of the technical words that you will come across.

Your teachers will provide you with access to past exam papers so that you can test your exam techniques and use of knowledge and understanding under exam conditions.

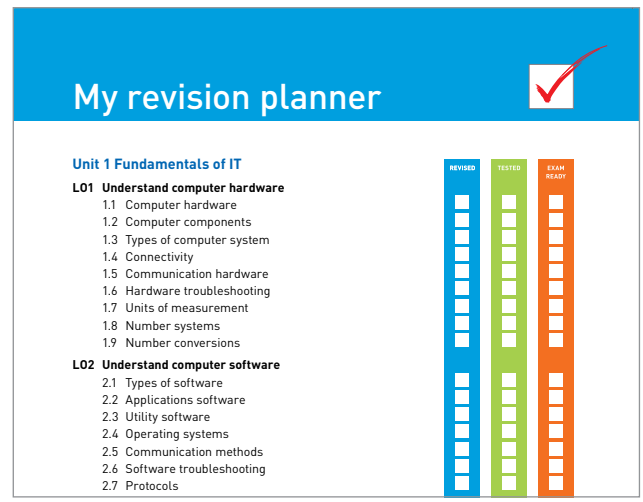
Tick to track your progress

Use the revision planner to plan your revision unit by unit and learning outcome by learning outcome, as well as the exam techniques that you have learnt. Tick each box when you have:

- revised and understood the assessment criteria
- revised and understood the different exam techniques
- successfully tested yourself using past papers.

Remember

This is your revision guide, so it is important that you use it effectively to meet your individual needs. You may find it useful to add additional notes as you work through the various topics.



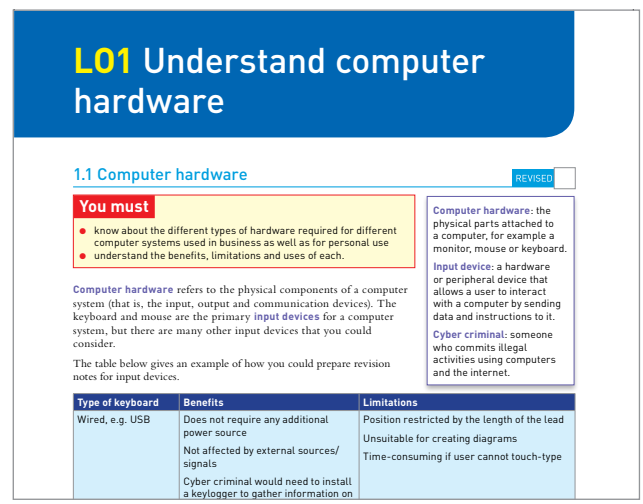
My revision planner

Unit 1 Fundamentals of IT

L01 Understand computer hardware
- 1.1 Computer hardware
- 1.2 Computer components
- 1.3 Types of computer system
- 1.4 Connectivity
- 1.5 Communication hardware
- 1.6 Hardware troubleshooting
- 1.7 Units of measurement
- 1.8 Number systems
- 1.9 Number conversions

L02 Understand computer software
- 2.1 Types of software
- 2.2 Applications software
- 2.3 Utility software
- 2.4 Operating systems
- 2.5 Communication methods
- 2.6 Software troubleshooting
- 2.7 Protocols

REVISED TESTED EXAM READY



L01 Understand computer hardware

1.1 Computer hardware REVISED

You must
- know about the different types of hardware required for different computer systems used in business as well as for personal use
- understand the benefits, limitations and uses of each.

Computer hardware refers to the physical components of a computer system (that is, the input, output and communication devices). The keyboard and mouse are the primary **input devices** for a computer system, but there are many other input devices that you could consider.

The table below gives an example of how you could prepare revision notes for input devices.

Computer hardware: the physical parts attached to a computer, for example a monitor, mouse or keyboard.

Input device: a hardware or peripheral device that allows a user to interact with a computer by sending data and instructions to it.

Cyber criminal: someone who commits illegal activities using computers and the internet.

Type of keyboard	Benefits	Limitations
Wired, e.g. USB	Does not require any additional power source	Position restricted by the length of the lead
	Not affected by external sources/ signals	Unsuitable for creating diagrams
	Cyber criminal would need to install a keylogger to gather information on	Time-consuming if user cannot touch-type

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Features to help you succeed

The revision guide is broken down unit by unit, so you have:

- Unit 1 Fundamentals of IT
- Unit 2 Global information
- Unit 3 Cyber security

Within each unit you will see the learning outcome title and the relevant topic for each learning outcome.

You must

This emphasises what you need to know and understand, as well as what you must be able to do.

Now test yourself

These short, knowledge-based questions provide the first step in testing your learning.

Definitions and key words

Clear, concise definitions of essential key terms are provided where they first appear.

Revision activities

There are revision activities throughout the book. These include completing tables with information you have learnt in class, and carrying out research, for example to recommend an IT system to a particular business.

Exam techniques

Guidance on how to use the pre-released case studies for Units 2 and 3 effectively is given, as well as how to answer the questions in the context of the case studies. There is also guidance on how to answer questions that include the words 'explain', 'justify', 'analyse' and 'evaluate', as well as level of response questions.

Preparation for revision

Remember: the main reason why people fail exams is a lack of study beforehand.

- There is quality and there is quantity – neither is a substitute for the other.
- You will need to do a lot of reading about the subject.
- Make notes as you study. If you cannot think of anything to write down from a page, you have not read it sufficiently or carefully enough.
- Practise, practise, practise. Do as many past exam papers as you can. There are only so many questions an examiner can ask.
- Play to your strengths and work on your weaknesses. During an exam, you will answer questions that you know the best and find the easiest; this is called 'playing to your strengths'. When revising, do the complete opposite and work on the areas where you are weaker; this is called 'working on your weaknesses'.

Revision techniques

- Spread out your revision – do not leave it until the last minute.
- Don't be afraid to fail. Practising with past exam papers will help you to improve and, by the time the exam day arrives, you will be more confident.
- Try to recreate exam conditions while you revise: time yourself; hone your skills for reading and answering questions under timed conditions.
- Do not just read through your notes and try to memorise them. Make further notes from them to reinforce your understanding.

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My revision planner

Unit 1 Fundamentals of IT

LO1 Understand computer hardware

1.1 Computer hardware
1.2 Computer components
1.3 Types of computer system
1.4 Connectivity
1.5 Communication hardware
1.6 Hardware troubleshooting
1.7 Units of measurement
1.8 Number systems
1.9 Number conversions

LO2 Understand computer software

2.1 Types of software
2.2 Applications software
2.3 Utility software
2.4 Operating systems
2.5 Communication methods
2.6 Software troubleshooting
2.7 Protocols

LO3 Understand business IT systems

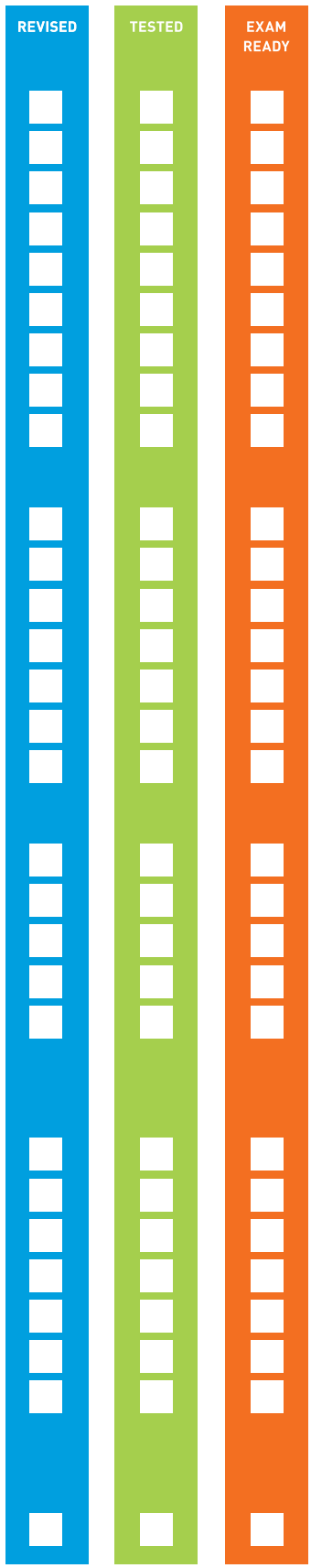
3.1 Types of servers
3.2 Virtualisation
3.3 Networking characteristics
3.4 Connectivity methods
3.5 Business systems

LO4 Understand employability and communication skills used in an IT environment

4.1 Communication skills
4.2 Communication technology
4.3 Personal attributes
4.4 Ready for work
4.5 Job roles
4.6 Professional bodies
4.7 Industry certification

LO5 Understand ethical and operational issues and threats to computer systems

5.1 Ethical issues



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5.2 Operational issues
5.3 Threats
5.4 Physical security
5.5 Digital security
5.6 Safe disposal of data and computer equipment

Unit 2 Global information

LO1 Understand where information is held globally and how it is transmitted

1.1 Holders of information
1.2 Types of information storage media
1.3 Types of information access and storage devices
1.4 The internet
1.5 World wide web (www) technologies
1.6 Information formats
1.7 Advantages
1.8 Disadvantages

LO2 Understand the styles, classification and the management of global information

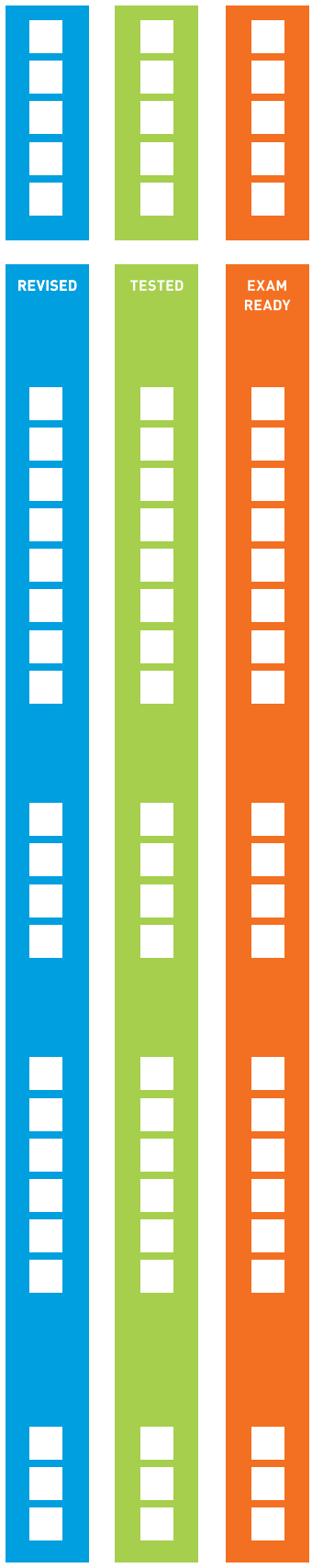
2.1 Information styles and their uses
2.2 Information classification
2.3 Quality of information
2.4 Information management

LO3 Understand the use of global information and the benefits to individuals and organisations

3.1 Data versus information
3.2 Categories of information used by individuals
3.3 Categories of information used by organisations
3.4 Stages of data analysis
3.5 Data analysis tools
3.6 Information system structure

LO4 Understand the legal and regulatory framework governing the storage and use of global information

4.1 UK legislation and regulation relating to the storage and use of information
4.2 Global information protection legislation and regulation
4.3 Green IT



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L01 Understand computer hardware

1.1 Computer hardware

REVISED

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The table below gives an example of how you could prepare revision notes for input devices.

Type of keyboard	Benefits	Limitations
Wired, e.g. USB	Does not require any additional power source Not affected by external sources/ signals Cyber criminal would need to install a keylogger to gather information on what is being typed in	Position restricted by the length of the lead Unsuitable for creating diagrams Time-consuming if user cannot touch-type
Wireless, e.g. Bluetooth	Can be placed at any convenient location on the desk Reduces workspace clutter	Requires powering by batteries Can be affected by other nearby wi-fi signals **Cyber criminals** can intercept signals as most wireless keyboards are unencrypted and unsecured Unsuitable for creating diagrams Time-consuming if user cannot touch-type
Integrated, e.g. laptops (although an external keyboard can be attached)	Smaller than a standard keyboard More mobile	Keys closer together can mean more typing errors Can have a lack of control keys or keypad
On screen, e.g. smartphones, tablets, touchscreen monitors (on-screen keyboards)	More mobile	Small, which can affect typing speed and accuracy Fingerprints can cause functionality issues Smaller screen restricts readability

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Revision activity

A business has received numerous requests from its employees to have wireless keyboards instead of wired ones. The business has asked for your advice on whether it is something they should consider doing.

- Identify which keyboard you would recommend.
- **Explain** why the keyboard you have recommended would be more appropriate for the employees.

Examples of other input devices include:

- barcode readers
- biometrics
- digital cameras
- gamepads, joysticks
- light pens
- magnetic strip readers
- microphones
- mouse
- scanners
- stylus
- webcam
- graphics tablet.

Revision activity

Research some of the other input devices commonly used in business and for personal use. Make a note of the uses, benefits and limitations for each one.

Output devices can come in many formats, for example:

- hard copy (printed on paper, card, etc.)
- on screen
- audio
- video.

The table below is an example of how you could prepare revision notes for output devices.

Type of monitor	Benefits	Limitations
CRT (cathode ray tube); rarely used, as old technology		Heavy, bulky and costly to replace
LCD (liquid crystal display)	Compact size, which makes them lightweight Does not consume as much electricity as a CRT monitor Can run off batteries, so ideal for laptops Transmitted images are not geometrically distorted and have little flicker	Relatively high cost Image quality not consistent if viewed from different angles **Resolution** of monitor is not always constant Alterations to resolution can result in reduced performance
LED (light-emitting diodes)	Uses less power than CRT or LCD monitors, therefore more environmentally friendly Displayed images have higher contrast Less negative impact on the environment when disposed of More durable than CRT or LCD monitors Features a very thin design Does not produce a lot of heat when running	More expensive

Explain: leads on from a description to include the purpose or reasons.

Output device: a peripheral that receives data and instructions from a computer system to display, project or physically reproduce data that has been processed or stored.

Resolution: the number of horizontal and vertical pixels on a monitor; the higher the number of pixels, the higher the resolution. More screen image can be displayed without scrolling. The image is sharper, but the icons and text will look smaller.

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Type of monitor	Benefits	Limitations
Touchscreen	Increased desk space (depending on the use; you do not have to attach a keyboard or mouse) Easier to use for novice computer users Increased speed compared to using a keyboard or mouse to move and select objects Easier to clean than a regular monitor as it is made out of glass or something similar	Users must sit closer to the screen in order to touch it Depending on the size of the screen and the size of the icons/text, it may be difficult to touch small objects on the screen Displays get dirty because of the constant touching with fingers

Things to consider when selecting a monitor:

- where the monitor is to be used (for example desktop, laptop)
- what type of work will be carried out on it (for example, graphic designers tend to access multiple windows and use high-resolution screens)
- whether there is a budget restriction with respect to cost
- what features are required (for example does it have a swivel base; does it have an adjustable height?)
- size: this links in with where it is to be used and the purpose
- second monitor: again this links to purpose; would the user benefit from dual displays?

Revision activity

A web development business is upgrading its computer system and is looking for advice on which monitors to purchase for the following departments:

- finance
- web and graphic design
- administration.

Recommend monitors for each of the departments and justify the recommendations you have made.

Examples of other output devices include:

- printers
- plotters
- headphones
- speakers
- projectors.

Remember

Some devices are known as input/output (I/O) devices, for example:

- headphones with a microphone
- touchscreen monitors.

It is important to consider how input and output devices can be used by business as well as from a personal point of view.

The following table considered the features, uses and purpose of a range of **communication devices**.

Revision activity

Research some of the other output devices commonly used in business and for personal use. Make a note of the uses, benefits and limitations of each one. Put your notes in a table similar to the one created for monitors above.

Communication device: a hardware device that transmits data from one machine to another using analogue or digital signals.

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Type of communication device	Features, uses and purpose
Smartphone	Small computer that also functions as a telephone. Features can include: ● digital voice service ● internet access ● email and text messaging ● MP3 player ● digital camera/video recorder ● a wide range of computer applications for business
Laptop	Mobile computer Similar functionality to a PC Allows internet access for instant messaging, email and video conferencing
Bluetooth device	Enables devices to communicate with each other using radio frequency (RF) technology; for example: ● headphones ● keyboard and mouse ● speaker ● smartwatch or health monitor ● car (for hands-free calls) ● lock (to remotely lock and unlock a door)
Infrared (IR) device	Allows for the transference of data wirelessly, for example: ● remote control ● keyboard and mouse
Router	Allows multiple computers to join the same network (this can be through the ethernet ports or wirelessly)
Modem	Connects to the internet service provider (ISP) either through cable, digital subscriber line (DSL) or fibre-optic internet service. **Cable modems** have a coaxial connection (similar to a TV or cable box); **DSL modems** have a RJ-11 connection (same as a telephone connector), which connects to a telephone socket in the wall. Because the final part of the fibre-optic signal is sent over a copper coaxial cable, a modem is still required
Hybrid	A modem and router combined into a single device; usually offered by ISPs to make the set-up process easier
Network interface card (NIC)	An expansion card that enables a computer to connect to a network using an ethernet cable (most computers have a network interface built into the **motherboard**)
Wi-fi adapter	Integrated (built-in) as standard on new computers USB network adapters plug into a standard USB port

Modem (cable): MOdulator/DEModulator; a hardware device that enables a computer to send and receive information over telephone lines by converting digital data into an analogue signal.

Modem (DSL): a hardware device that allows a computer to communicate with an ISP over a DSL connection. A traditional phone line (RJ-11) connects to the back of the DSL modem and the Cat5 (ethernet) cable connects the modem to a router or computer.

Motherboard: a printed circuit board connecting all of the peripherals and components of a computer enabling them to communicate. It regulates the power received by the hard drive, graphics card, central processing unit (CPU) and system memory from the power supply.

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Revision activity

Research the communication devices given in the table above. Create a table similar to the one below to record the benefits and limitations of each. You should also think about different businesses and how they may use these devices, as well as personal use.

Communication device	Benefits	Limitations	Type of business	How it would be used	Personal use
Smartphone					
Laptop					
Bluetooth device					
Infrared (IR) device					
Router					
Modem					
Hybrid					
Network interface card (NIC)					
Wi-fi adapter					

Now test yourself

TESTED ☐

1. Explain one advantage and one disadvantage of an integrated keyboard.
2. A supermarket asks customers to answer a short online questionnaire before leaving the shop. The customers stand in front of a screen which has a series of yes/no questions to answer. Which type of input device would be the most appropriate for customers to use? Justify your answer.
3. What type of hardware device is a headphone with a microphone attached?
4. Explain what a network interface card (NIC) is.

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