

## Y12 BTec Level 3 in Information Technology

### Preparation Work

Each task will list the learning objectives (LOs) as well as tasks

Instructions for using this work book:

1. Research each task
2. Keep a record of any useful websites / books you use, perhaps store this as a reading log (bibliography, weblibliography) or bookmarks webpages as internet favourites
3. Keep a record of your notes, as they may be used in coursework later – the aim of this work booklet is to introduce you to computer theory as well as getting you used to practical research tasks often used in the Btec.
4. There are 5 sections (Aims) - A1 to A5:
  - a. A1: Digital Devices
  - b. A2i: Input – Output – Storage
  - c. A2ii: Manual – Automatic Data Processing
  - d. A3i: Types of operating Systems
  - e. A3ii: User Interfaces
  - f. A3iii: Utilities and Applications Software
  - g. A4: Emergent Technologies
  - h. A5: Choosing an IT system

You should spend approx 1 hour on each section

# A1 Digital devices, their functions and use

**LO1** – Understand the digital devices that form part or all of IT systems.  
**LO2** – Understand the function and use of digital devices for Education, Retail & Organisational use.  
**LO3** – Understand the function and use of digital devices for Personal, Creative & Social use.

## Tasks

**Task 1** – Research Multifunctional Devices & Fill out the following table in detail.

Devices	Functions	Uses	Advantages & Disadvantages
Multifunctional Devices			
Personal Computers			
Mobile Devices			
Servers			
Entertainment Systems			
Digital Cameras			
Navigation Systems			
Data Capture & Collection Systems			
Communication Devices & Systems			

**Task 2** – Spend 1 hour researching into how digital technologies are used in Education, Retail, Organisations, Creative Industries, Personally and Socially. Fill in the following table with your findings.

Sectors	Digital Devices Used	Function of Devices in Sector	Uses of Devices in Sector
Education			
Retail			
Organisations			
Creative			
Personal			
Social			

### Task 3 – Exam Questions

1. Bobbies is a new small supermarket chain with 6 stores.

State 2 different data capture & collection systems that might be used in supermarkets. [2]

2. Explain how the 2 data capture & collection systems might be used in the supermarkets and why they would benefit the business. [4]

3. Jerry works in the games industry and builds 3D games using a PC for use on tablets. He creates both the graphics and does all of the coding for the games.

State two different input devices and two different output devices, explaining how they would be useful for Jerry in the creation of video games. [8]

## A2 Input, Output & Storage

**LO1** – Understand the Input devices that form part or all of IT systems.  
**LO2** – Understand the Output devices that form part or all of IT systems.  
**LO3** – Understand the Storage devices that form part or all of IT systems.

### Tasks

**Task 1** – Fill in the following table to show your understanding of Input & Output Peripherals.

Peripherals	Input or Output	Uses
Keyboard		
Monitor		
Mouse		
Touch Screen		

<b>Projector</b>		
<b>Microphone</b>		
<b>Printer</b>		

**Task 2** – Research Storage Devices & Fill out the following table in detail.

<b>Storage Device</b>	<b>Functions</b>	<b>Uses</b>	<b>Advantages &amp; Disadvantages</b>
<b>Hard Drive</b>			
<b>Solid State Drive</b>			
<b>USB Memory Stick</b>			
<b>SD Cards</b>			
<b>Optical Disks</b>			
<b>Magnetic Tape</b>			



Task 3 – Answer the following questions about cloud storage.

Cloud storage means:

The Advantages of Cloud Storage are:

The Disadvantages of Cloud Storage are:

#### Task 4 – Exam Questions

1. Explain 2 reasons why you would choose a Solid State Drive over a Hard Disk Drive? [2]

2. Lance is a video editor. Explain 2 reasons why lance should not use a memory stick to transfer video footage between his office and his home. [4]

3. Jane rides mountain bikes and wants to record her riding through a helmet mounted camera in High definition. Name a storage device that would be suitable for this and state why you chose your answer. [4]

## A2 Manual & Automatic Data Processing

LO1 – Understand what Manual Data processing is.  
LO2 – Understand what Automatic data processing is.  
LO3 – Evaluate examples of Manual and Automatic data processing.

### Tasks

**Task 1** – Write a definition for Manual Data Processing (Book P12).

**Task 2** – Find 5 examples of Manual Data Processing and give some of the Advantages and Disadvantages of Processing the data manually.

Example of Manual Data Processing	Advantage	Disadvantage

**Task 3** – Write a definition for Automatic Data Processing.

**Task 4** - Find 5 examples of Automatic Data Processing and give some of the Advantages and Disadvantages of Processing the data automatically.

Example of Automatic Data Processing	Advantage	Disadvantage

## A2 Accessibility Devices

**LO1** – Define what an Accessibility Device is.  
**LO2** – Describe different types of Accessibility Device.  
**LO3** – Select different Accessibility Devices for different situations.

**Task 5** -Define what an Accessibility Device is.

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**Task 6** - Fill in the following table describing the Accessibility Device and listing its Advantages and Disadvantages.

Device	Description	Advantage	Disadvantage
Speech Recognition Software			
Screen Readers			
Touch Screens			
Big Key Keyboard			
Ergonomic Keyboard			
Screen Magnifiers			
Screen Overlays			
Eye Motion Sensors			

### Task 7 – Exam Questions

1. Give 2 advantages of using biometric readers for use in personal identification systems? [2]
2. What are 2 disadvantages of manual data processing over automatic data processing? [2]
3. What are 3 benefits of using smart meters in the home to monitor Gas and Electricity usage? [3]
4. Tommy has poor vision. Give 2 ways that Tommy could use software to help him use his desktop computer at work. [4]



5. Sally has a disability which affects the use of her arms.

Give 2 devices that Sally can use to help her use an ICT system and explain how the device benefits Sally. [4]

### A3 Types of Operating System & the role of Operating Systems.

LO1 – Define Real-time, Single-user single task, Single-user multi-tasking & Multi-user Operating systems.  
LO2 – Know the advantages & Disadvantages of Real-time, Single-user single task, Single-user multi-tasking & Multi-user Operating systems.  
LO3 – Define the role of the Operating System in a computer system.  
LO4 – Understand the factors that affect the performance of an operating system.

#### Tasks

**Task 1** – What is an Operating System?

**Task 2** – Define the following types of user interface including their advantages and disadvantages.

Operating System	Definition	Advantages	Disadvantages
Real-time			
Single-user single task			
Single-user multi-tasking			
Multi-user			

**Task 3** – Operating Systems perform many functions. Describe how the Operating System manages the 5 functions below.

Function	Describe how it manages the function
Networking	

Security	
Memory management	
Multi-Tasking	
Device Drivers	

**Task 4** – Describe how the following factors affect the performance of an Operating System.

Function	How does it affect the performance?
Hardware	
Malware	
Virtual Memory	

**Task 4 – Exam Questions**

1. Compare and contrast the use of single user single-task operating systems compared to the use of single user multi-tasking operating systems? [6]

2. Compare and contrast the use of Real-Time operating systems compared to the use of Multi-User operating systems? [4]

3. Describe the ways that an operating system helps to manage the security of an ICT system. [4]

4. What is the role of the operating system when managing memory? [4]

5. Analyse the factors that affect the performance of an operating system [8]

### A3 User Interfaces & File Types.

LO1 – Describe Graphical, Command Line, Menu Based and Adapted user interfaces.  
LO2 – Describe the Advantages & Disadvantages of Graphical, Command Line, Menu Based and Adapted user.  
LO2 – Describe common file types used in computer systems.

#### Tasks

**Task 1** – What is a User Interface?

**Task 2** – Fill in the table to explain each of the different types of user interface.

Interface	Definition?	Where are they used?
Graphical		
Command Line		
Menu Based		
Adaptive		

**Task 3** – Explain the advantages and disadvantages of different user interfaces.

Interface	Advantages	Disadvantages
Graphical		
Command Line		
Menu Based		
Adaptive		

**Task 4** – Explain the advantages and disadvantages of different user interfaces.

Media	File types	Advantages & Disadvantages
Video	MOV	
	AVI	
	MP4	
Image	BMP	
	TIF	
	JPG	
	GIF	
	PNG	
	RAW	
Application Software Files	DOC	
	XLSX	
	MDB	

**Task 4 – Exam Questions**

- Tommy is a non-expert user of computer systems and has little experience of using ICT systems. Which user interface would be good for Tommy to use and explain why your choice would be more suited to Tommy? [4]

- Betty is an expert user of computer systems and has lots of experience of using ICT systems. Which user interface would be good for Betty to use and explain why your choice would be more suited to Betty? [4]

- Kareem is a professional photographer who needs to take high quality images. What would be a good file format for him to use? Explain your answer. [3]

4. Kareem wants to put the images onto a website. What would be a good file format for Kareem to convert the large images into? Explain your answer. [3]

### A3 Application & Utility Software.

LO1 – Understand the uses of application software.  
LO2 – Understand the uses of utility software.  
LO3 – Understand the differences between Propriety and Open Source software.  
LO4 – Describe the factors that affect the choice and performance of software.

#### Tasks

**Task 1 – What is Software?**

**Task 2 – Giving examples, explain the different uses of software.**

Software	Definition	Examples	Why it's needed?
Productivity Software			
Graphics Software			
Communications software			

**Task 3 – Describe each of the following Utility Software explaining what it is used for giving advantages and disadvantages where appropriate.**

Utility Software	Description with Advantages & Disadvantages where appropriate
File Compressors	
Back-up software	
Disk Defragmenter	
Firewalls	
Anti-Virus	
Registry Cleaners	
System Profilers	

**Task 4** – List the advantages and disadvantages of Proprietary and Open Source Software.

Software	Advantages	Disadvantages
Proprietary		
Open Source		

**Task 5** – What are the factors that affect the choice and performance of software?

Choice	Performance

**ask 6** – Exam Questions

1. Jayne is trying to decide on a piece of software to use in her shop to manage orders and deliveries. Analyse the benefits and drawbacks of Jayne using open source software for meeting her needs? [4]

2. Bob is a graphic designer he is thinking of using propriety software to create his graphics. Analyse the benefits and drawbacks for Bob when choosing Propriety Software to meet his needs? [4]

3. Zhulee wants to improve the performance of her laptop as it is running very slowly. Analyse the features of 2 different utility software tools that can help Zhulee improve the speed of her laptop? [6]

## A4 Emerging Technologies

LO1 – Understand how Emerging Technologies are used by Individuals and Organisations.  
 LO2 – Understand the implications on ICT Systems that Emerging Technology has.  
 LO3 – Understand the implications of Emerging Technologies on Individuals and Organisations.

### Tasks

**Task 1** – Find out about each of the following Emerging Technologies including their uses and their Advantage and Disadvantages

	What is it?	Uses	Advantages & Disadvantages
Artificial Intelligence			
Biometrics			
Robotics			
Virtual Reality			





**Task 2** – Looking at the same 4 areas from task 1. Explain how each of the emerging technologies are used by Individuals and Organisations.

	Individuals	Organisations
Artificial Intelligence		
Biometrics		
Robotics		
Virtual Reality		

Task 3 – Give some of the implications that Emerging Technology will have.

#### Task 4 – Exam Questions

1. What are some of the advantages and disadvantages of using robots in the manufacturing industry? [6]
2. What are some of the advantages of using biometrics for access to hardware such as mobile phones? [4]

### A5 Choosing ICT Systems

**LO1** – Understand the factors that should be considered when choosing an ICT system.  
**LO2** – Understand the terms User Experience, Specifications, Compatibility, Connectivity and Cost.  
**LO3** – Understand the terms Efficiency, Productivity, Implementation and Security.

#### Tasks

**Task 1** – What needs to be considered when choosing an ICT System?

	What needs to be considered?
User Experience	
Specifications	
Compatibility	
Connectivity	
Cost	
Efficiency	
Productivity	
Implementation	
Security	

## Task 2 - Exam Questions

1. Thomas needs a system to create graphics for his graphic design company. Explain three factors that should be considered by Thomas when choosing his ICT system? [6]

2. Suzanne needs an ICT system to complete her college work on. Explain three different factors that should be considered by Suzanne when choosing her ICT system? [6]

3. Dennis runs a large car garage and has recently decided that using ICT might help in speeding up day to day processes. Explain three different factors that should be considered by Dennis when choosing his ICT system? [6]