1.1 Hardware and Software

- Define hardware as consisting of physical components of a computer system
- Identify internal hardware devices (e.g. processor, motherboards, random access memory (RAM), read-only memory (ROM), video cards, sound cards and internal hard disk drives.
- Identify external hardware devices and peripherals (such as monitors, keyboards, mice, keyboards, printers as input and output devices and external storage devices in general)
- Define software as programs for controlling the operation of a computer or processing of electronic data
- Identify the two types of software applications software and system software
- Define applications software (e.g. word processing, spreadsheet, database management systems, control software, measuring software, applets and apps, photo-editing software, video-editing software, graphics manipulation software)
- Define system software (e.g. compilers, linkers, device drivers, operating systems and utilities)

1.1 Hardware and Software

Define hardware as consisting of physical components of a computer system

What is Hardware?

- Hardware are the physical components which make up the computer system.
- Each item of hardware have their **specific roles** in a computer system.
- Hardware components can either be internal or external.











1.1 Hardware and Software

Internal hardware devices

Central Processing Unit (CPU)



The **CPU** is the 'brain' of the computer. It is the device that carries out calculations to complete software instructions.

Motherboard



The **motherboard** is circuit board which is connects to main components of the computer system.

Memory



Any data or instructions that are to be processed by the CPU must be placed into main **memory**.

1.1 Hardware and Software

Internal hardware devices

Graphic Video Cards



A graphics card is a device that attaches to the motherboard to enable the computer to process and display graphics.

Sound Card



A **sound card** is a device that attaches to the motherboard to enable the computer to input, process, and deliver sound

Internal Hard Disk



A hard disk drive is a hardware device that's used to store information like software and files. The capacity of hard drive ranges from GB to Tera Bytes.

1.1 Hardware and Software

Internal hardware devices

Network Card



A **network card** provides the computer with a network (internet connection) either through wireless signals or a physical cable connection.

Optical Disk Drive



The optical disk drive (CD/DVD/Blu-Ray) allows for optical disks to run on the computer. Also some optical disk drives are able to write "burn" data onto discs.

Power Supply



The **power supply** is connected to main power sources to give power to the computer system. The power supply connects to all the main components of the computer system including the motherboard, hard drive, optical drives etc.

1.1 Hardware and Software

External hardware devices

Input Hardware Devices – Input data into a Computer

Examples

- Mouse
- Keyboard
- Microphone







Output Hardware Devices – Outputs data from a computer

Examples

- Monitor
- Speakers
- Printers









External Storage Devices – Provides external storage or backup solutions

Examples

 External Hard drive









1.1 Hardware and Software

Computer Software

What is Software?

Software is a **collection of instructions** that can be 'run' on a computer. These instructions tell the computer what to do.

Software is **not** a **physical thing** (but it can of course be stored on a physical medium such as a CD-ROM), it is just a bunch of codes.

For a computer system to be **useful** it has to consist of **both hardware and software**.

















1.1 Hardware and Software

Applications Software and System Software

Application Software

Examples

- Word Processor
- Spreadsheet
- Databases

Application software are designed to allow users to complete specific tasks. This may be to:

- Write a letter/Present information
- Browse the internet
- Manipulate data in a spreadsheet or database
- Manipulate graphics, sound or video.









System Software

Examples

- Operating Systems
- Device Drivers
- Utilities (antivirus)

System software are normally involved in the running of the computer:

- Operating systems to provide a user interface
- Device drivers which allow hardware components to work.
- Utility software which maintain the computer performance.









1.1 Hardware and Software

Application Software Examples

Spreadsheet Word Processing Database Use to create to organise and Database is used to insert Used to prepare reports, school essays etc. manipulate numeric data. and organise data using fields and records. ----CHARLES THE PARTY OF THE PARTY Use of various formulas to Create a table so that Create New or edit records can be inserted. existing text documents. carry out set tasks: Formatting tools Sum, Max, Min, Average Run queries using search Create font styles Count, CountA criteria to find specific CountIf & SumIF Importing tables/images data. Spell Check Lookups Create reports including IF and Nested Ifs Copy/Paste labels from the search Find/Replace Apply various formatting to criteria. Page layout cells/ Create graphs (Ba/Pie charts)

1.1 Hardware and Software

Application Software Examples

Photo Editing Graphics Manipulation Video Editing Used to edit and format video Used to edit digital images to Used to create and edit either touch up or to apply bitmap and vector graphics. using various tools and various formatting techniques. techniques. Contrast/Brightness Pixels in bitmap images Split and Trim videos Use of layers can be changed to Create split screens Filter tools produce a different image. Rearranging order of clips. Lighting effects Vector images use: Transitions between clips Liquify (change features of Lines (Fade) a face) Curves **Inserting Audio Brush tools Text** Applying filters and using Clone/Stamp tool video enhancement techniques

1.1 Hardware and Software

Application Software Examples

Apps (Phone Applications)

Apps are the software which runs on mobile phones. They usually come with the phone or can be downloaded and updated.



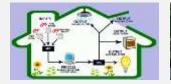


Games (Angry Birds)

- Video/Music Streaming (YouTube)
- Social Media (Facebook, Twitter, Instagram)
- Communication (Whats App, Viber)
- Camera (Editing images)
- GPS (Satellite navigation)
- Health/ Fitness

Measuring and Control Software

Measuring and control software which are responsible for changing physical conditions in an environment.





Measuring

 Sensors take readings which are processed by the computer or microprocessor.

Control Software

 By comparing sensor readings to a pre-set level the control software will decide on an output (For example to increase or decrease the heat in a green house.

1.1 Hardware and Software

System Software Examples

Operating Systems



Manages computers functions including hardware devices (input/output). Also provides users with a GUI interface



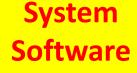
Device Drivers

Allows hardware devices to run on the computer including printers, sound, graphics and network cards.



Utilities

Help to manage and maintain computer resources and performance by running specific tasks.





Combines object files produced by a complier into a A single program.



Compiler

Translates a program written In a specific language which Can be understood by the computer.

1.1 Hardware and Software

Describe the difference between Hardware and Software?

Key Words: physical components, instructions



Exam Question

Hardware are the physical components which make up the computer system. Software is a collection of instructions that can be 'run' on a computer. These instructions tell the computer what to do.

Describe the difference between Application and System Software?

Key Words: specific tasks (Word Processor), manage and maintain (Operating System)

Application software are designed to allow users to complete specific tasks. For example a Word Processor is used to write a letter. System software is used to manage and maintain the computer system. An operating system such as Windows 10 is used to manage the functions of the computer system.