Prova scritta n.ro 1

a) Il candidato presenti brevemente la figura del TITOLARE DEL TRATTAMENTO in accordo con il GDPR.

b) Le Aziende Sanitarie hanno un debito informativo verso la Regione Piemonte, che rendiconta e certifica la loro produttività. Il candidato presenti brevemente le aree di produzione che le Aziende sono obbligate a rendicontare e descriva il contenuto di almeno un flusso.

c) Il candidato descriva brevemente il modello ISO/OSI (*ISO/IEC 7498*) esplicandone la suddivisione in livelli e funzionalità.

durata 60 minuti

PROVA ESTRATTA

PROVA NON ESTRATTA

Prova scritta n.ro 2

a) Il candidato presenti brevemente la figura del DPO (*Data Protection Officer*) in accordo con il GDPR.

b) Il candidato spieghi brevemente le funzionalità di un sistema ADT e ne illustri le caratteristiche e le integrazioni che deve prevedere.

c) Il candidato descriva brevemente il funzionamento di un sistema di crittografia a chiave pubblica.

durata 60 minuti

PROVA NON ESTRATTA

Prova scritta n.ro 3

a) Il candidato presenti brevemente la figura del SOGGETTO INTERESSATO in accordo con il GDPR.

b) Il candidato spieghi brevemente le funzionalità di un sistema CUP e ne illustri le caratteristiche e le integrazioni che deve prevedere.

c) Il candidato descriva brevemente lo standard TCP/IP (*rfc 1180-791-793 et alii*) esplicandone la suddivisione in livelli e funzionalità.

durata 60 minuti

PROVA NON ESTRATTA

Prova pratica n.ro 1

Il candidato predisponga uno schema ed illustri un'infrastruttura di rete che enfatizzi gli aspetti di sicurezza informatica nel seguente scenario:

- Azienda Sanitaria suddivisa in tre sedi (una principale con 1000 utenti circa e 2 secondarie con 100 utenze circa ciascuna);
- la produttività è suddivisa nelle tre sedi aziendali
- la sede principale ha strutturati un dipartimento di ricerca e sviluppo e la maggior parte delle attività amministrative;
- necessità di collegamento da fuori sede per le attività amministrative e per lo smart-work.

Lo schema di progetto, per semplicità, dovrà limitarsi ai primi 4 livelli del modello ISO/OSI.

durata 30 minuti

Prova pratica n.ro 2

Il candidato predisponga una rappresentazione grafica e schematica dei principali Sistemi Informativi di una Azienda Sanitaria Locale che includa ospedali e territorio, avendo cura di dettagliare i flussi di dati tra i sistemi indicati.

durata 30 minuti

PROVA NON ESTRATTA

PROVA NON ESTRATTA

Prova pratica n.ro 3

Il candidato elenchi gli elementi principali di un documento che possa fungere da specifica tecnica da utilizzarsi per la predisposizione di un capitolato finalizzato all'acquisizione di un software gestionale interno dei flussi sanitari regionali ad uso di una Azienda Sanitaria Locale.

durata 30 minuti

DOMANDE PROVA ORALE

Quesito n.ro 1

Quali sono le funzionalità di un Firewall?

Quesito n.ro 2 GIOVANNI MONELLA

Cos'è il CLOUD e quali sono i principali vantaggi e svantaggi?

Quesito n.ro 3 GIANLUCA DELLAGIOVANNA

Cosa si intende per integrità, disponibilità e riservatezza del dato?

Quesito n.ro 4 SIMONA MAZZOCCO

Cos'è una DPIA (Data Protection Impact Analysis), su quali elementi si basa e che informazioni fornisce?

Quesito n.ro 5 LUCA DANCO

Cosa si intende per Data Breach e quali sono i tempi per la sua notifica al Garante per la Protezione dei Dati Personali?

Quesito n.ro 6

Cosa si intende "Attacco DDoS" (Distributed Denial of Service)?

Quesito n.ro 7 GABRIELE BARBERINI

Quali aspetti di sicurezza informatica vanno valutati in un sistema di Telemedicina?

Quesito n.ro 8

Quali sono le principali differenze tra le precedenti versioni di HL7 e HL7 FHIR?

Quesito n.ro 9 SIMONA MAZZOCCO

Quali sono le funzioni di un Order Entry in una infrastruttura informatica sanitaria?

Quesito n.ro 10

Cosa si intende per LIS in una infrastruttura informatica sanitaria?

Quesito n.ro 11 GIOVANNI MONTELLA

I flussi sanitari della Regione Piemonte sono basati su tracciati .txt o .xml. Quali sono le peculiarità dei due formati e le loro differenze?

Quesito n.ro 12 LUCA DAVICO

Quali sono le tecniche per assicurare l'anonimizzazione e la pseudonimizzazione nei flussi sanitari regionali?

Quesito n.ro 13 GIANLUCA D'ELIA GIOVANNA

Si illustri il concetto di SDO (Scheda di Dimissione Ospedaliera).

Quesito n.ro 14 GABRIELLE BARBERIS

Cos'è FSE 2.0 e in che modo implementa il protocollo HL7?

Quesito n.ro 15

Illustrare concetti e funzionamento del protocollo DHCP (*rfc 2131*).

Quesito n.ro 16 LUCA DANCO Luca Danco

Illustrare concetti e funzionamento di un sistema DNS (*rfc 882-103-1035*).

Quesito n.ro 17 DENACIONANNA GIANLUCA

Illustrare concetti e funzionamento di una VLAN (*rfc 2674*).

Quesito n.ro 18 GABRIELE BARBERA Gabriele

Elencare ed illustrare le funzionalità dei principali dispositivi attivi presenti nelle reti di computer.

Quesito n.ro 19

Illustrare il concetto di cablaggio strutturato e se ne illustrino le principali caratteristiche (*ISO/IEC 11801*).

Quesito n.ro 20 SIMONA MAZZUCCO Simona Mazzucco

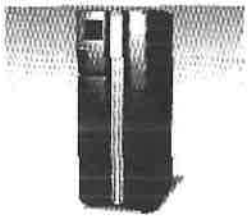
Si definisca il concetto di base di dati e se ne illustrino le principali caratteristiche.

Quesito n.ro 21 GIOVANNI MONELLA Giovanni Monella

Illustrare concetti e funzionamento di una Rete Privata Virtuale (*rfc 2764*).

3 Types of computer systems

A From mainframes to wearable computers



A **mainframe** is the most powerful type of computer. It can process and store large amounts of data. It supports multiple users at the same time and can support more simultaneous processes than a PC. The central system is a large server connected to hundreds of terminals over a network. Mainframes are used for large-scale computing purposes in banks, big companies and universities.

A **desktop PC** has its own processing unit (or CPU), monitor and keyboard. It is used as a personal computer in the home or as a workstation for group work. Typical examples are the IBM PC and the Apple Macintosh. It's designed to be placed on your desk. Some models have a vertical case called a tower.

A **laptop** (also called a **notebook PC**) is a lightweight computer that you can transport easily. It can work as fast as a desktop PC, with similar processors, memory capacity, and disk drives, but it is portable and has a smaller screen. Modern notebooks have a **TFT** (Thin Film Transistor) **screen** that produces very sharp images.

Instead of a mouse, they have a **touchpad** built into the keyboard – a sensitive pad that you can touch to move the pointer on the screen.

They offer a lot of connectivity options: **USB** (Universal Serial Bus) **ports** for connecting peripherals, slots for memory cards, etc.

They come with **battery packs**, which let you use the computer when there are no electrical outlets available.

A **tablet PC** looks like a book, with an LCD screen on which you can write using a special digital pen. You can fold and rotate the screen 180 degrees. Your handwriting can be recognized and converted into editable text. You can also type at the detached keyboard or use voice recognition. It's mobile and versatile.

A personal digital assistant or **PDA** is a tiny computer which can be held in one hand. The term PDA refers to a wide variety of **hand-held** devices, palmtops and pocket PCs.

For input, you type at a small keyboard or use a **stylus** – a special pen used with a **touch screen** to select items, draw pictures, etc. Some models incorporate **handwriting recognition**, which enables a PDA to recognize characters written by hand. Some PDAs recognize spoken words by using **voice recognition** software.

They can be used as mobile phones or as personal organizers for storing notes, reminders and addresses. They also let you access the Internet via **wireless** technology, without cables.

A **wearable computer** runs on batteries and is worn on the user's body, e.g. on a belt, backpack or vest; it is designed for mobile or hands-free operation. Some devices are equipped with a wireless modem, a small keyboard and a screen; others are voice-activated and can access email or voice mail.

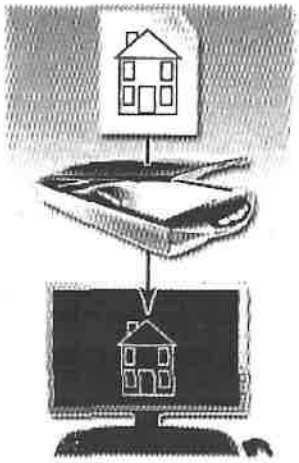
GIANNA DRUAGIONANNA

5 Input devices: the eyes of your PC

LUCA DAVICO Luca Davis

A Scanners

Input devices such as scanners and cameras allow you to capture and copy images into a computer.



A **scanner** is a **peripheral** that reads images and converts them into electronic codes which can be understood by a computer. There are different types.

- A **flatbed** is built like a photocopier and is for use on a desktop; it can capture text, colour images and even small 3D objects.
- A **film scanner** is used to scan film negatives or 35 mm **slides** – pictures on photographic film, mounted in a frame.
- A **hand-held scanner** is small and T-shaped, ideal to capture small pictures and logos.
- A **pen scanner** looks like a pen; you can scan text, figures, barcodes and handwritten numbers.

A pen scanner

Barcode scanners read barcodes on the products sold in shops and send the price to the computer in the cash register. **Barcodes** consist of a series of black and white stripes used to give products a unique identification number.

Barcode and reader

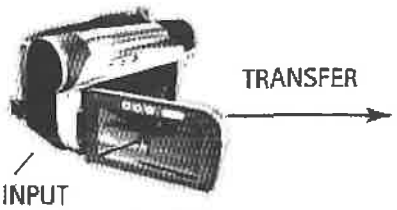
The **resolution** of a scanner is measured in **dpi** or dots per inch. For example, a 1,200 dpi scanner gives clearer, more detailed images than a 300 dpi scanner.

Most scanners come with **Optical Character Recognition** software. OCR allows you to scan pages of text and save them into your word processor; they can then be edited.

B Digital cameras

A **digital camera** doesn't use film. Photos are stored as digital data (bits made up of 1s and 0s), usually on a tiny storage device known as a **flash memory** card. You can connect the camera or memory card to a PC and then alter the images using a program like Adobe Photoshop, or you can view the images on a TV set. Many printers have a special socket so that you can print images directly from a memory card or camera.

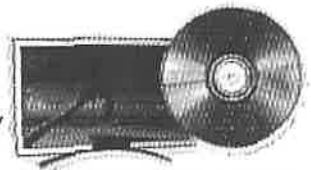
C Digital video cameras and webcams



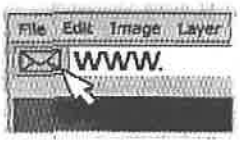
INPUT
A **digital video (DV) camera** records moving images and converts them into digital data that can be processed by a PC.

PROCESSING
You can manipulate video images with **video editing software**. You can cut, paste, add effects, etc.

OUTPUT
You can store or export the result.



Display it on a screen or create a DVD.



Email or put your movie on the Web.

Webcams (short for Web cameras) let you send and receive live video pictures through the Internet. They're primarily used for **video conferences** – video calls – but they can be used to record photos and video onto your hard disk.

The resolution of webcams is expressed in **megapixels** (million pixels). Webcams connect to the PC via a USB (universal serial bus) or FireWire port; they display video at 24 to 30 frames (pictures) per second. Some include a **headset** with a microphone and earpiece.

GABRIELE BARBERIS

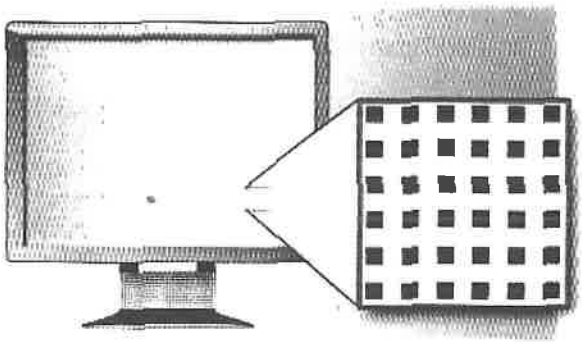
7 Output devices: display screens

A CRTs and LCDs

The screen of a computer is often known as the **monitor**, or VDU (visual display unit). Inside the computer, there is a **video card** which processes images and sends signals to the monitor.

When choosing a monitor, you have to take into account a few basics.

- Type of display – the choice is between a **CRT** or an **LCD** screen.
  The **Cathode Ray Tube** of a monitor is similar to a traditional TV set. It has three electron guns (one for each **primary colour**: red, green and blue) that strike the inside of the screen, which is coated with substances called **phosphors**, which glow and create colours. CRTs are cheap, but they are heavy, can flicker and emit radiation.
  A **Liquid Crystal Display** is made from flat plates with a liquid crystal solution between them. The crystals block the light in different quantities to create the image. **Active-matrix** LCDs use TFT (thin film transistor) technology, in which each pixel has its own transistor switch. They offer better quality and take up less space, so they are replacing CRTs.
- **Screen size** – the viewing area is measured **diagonally**; in other words, a 17" screen measures 17 inches from the top left corner to the bottom right.
- **Resolution** – the clarity of the image depends on the number of **pixels** (short for picture elements) contained on a display, horizontally and vertically. A typical resolution is 1,024 x 768. The sharpness of images is affected by **dot pitch**, the distance between the pixels on the screen, so a dot pitch of 0.28 mm or less will produce a sharp image.
- **Brightness** – the luminance of images is measured in cd/m² (candela per square metre).
- **Colour depth** – the number of colours a monitor can display. For example, a VGA monitor produces 256 colours, enough for home use; a SuperVGA can produce up to 16.7 million colours, so is ideal for photographic work and video games.
- **Refresh rate** – the number of times that the image is drawn each second. If a monitor has a refresh rate of 75 Hertz (Hz), it means that the screen is scanned 75 times per second. If this rate is low, you will notice a flicker, which can cause eye fatigue.

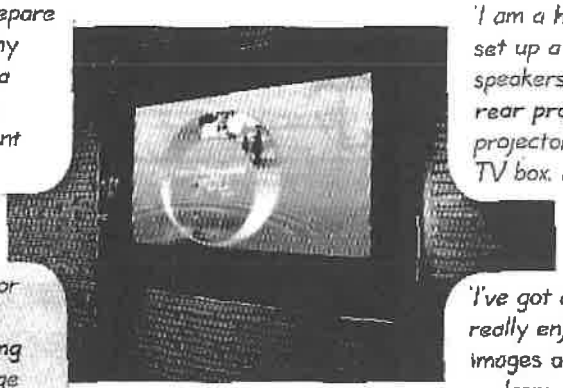


A colour pixel is a combination of red, green and blue subpixels

B Big screens: plasma and projection TVs

'I sometimes use a video projector in my Geography lessons. I prepare audiovisual presentations on my laptop and then connect it to a front-screen projector which displays the images on a distant screen or white wall.'

'I am a home cinema enthusiast. I've set up a system with a DVD recorder, speakers for surround sound, and a rear projection TV, which has the video projector and the screen within a large TV box. It's a real cinema experience.'



'I use a portable DLP projector for my business presentations. This is a digital light-processing device which creates the image with millions of microscopic mirrors arranged on a silicon chip.'

'I've got a 52-inch plasma display and really enjoy its advantages: high-contrast images and bright colours, generated by a plasma discharge which contains noble, non-harmful gases. Gas-plasma TVs allow for larger screens and wide viewing angles, perfect for movies!'

SIMONA MAZZUCCO Studente

4 Input devices: type, click and talk!

A Interacting with your computer

Input devices are the pieces of hardware which allow us to enter information into the computer.

B The keyboard

A standard PC keyboard has various groups of keys.

- **Alphanumeric keys** – these represent letters and numbers, arranged as on a typewriter.
- A **numeric keypad** appears to the right of the main keyboard and contains numeric and editing keys; the Num Lock key is used to switch from numbers to editing functions.
- **Function keys** appear at the top of the keyboard and can be programmed to do special jobs.
- **Cursor keys** include 'arrow keys' which move the insertion point, and keys such as Home, End, Page Up, and Page Down, which let you move around documents.
- **Dedicated keys** are used to issue commands or produce alternative characters. For example:
  Ctrl changes the functions of other keys (e.g. Ctrl + X cuts the selected text).
  Caps Lock sets the keyboard in 'CAPITALS' mode; it only affects letters.
  Enter (or **Return**) is pressed to select options from a menu or to start a new paragraph.
  Backspace deletes the character to the left of your current position.

C The mouse

A mouse is a hand-held device that lets you move a pointer (or cursor) and select items on the screen. It has one or more buttons to communicate with the PC. A scroll wheel lets you move through your documents or web pages The pointer looks like an I-bar, an arrow or a pointing hand.

An optical mouse has an optical sensor instead of a ball underneath.

A cordless (wireless) mouse has no cable; it sends data via infrared signals or radio waves.

Mouse actions:

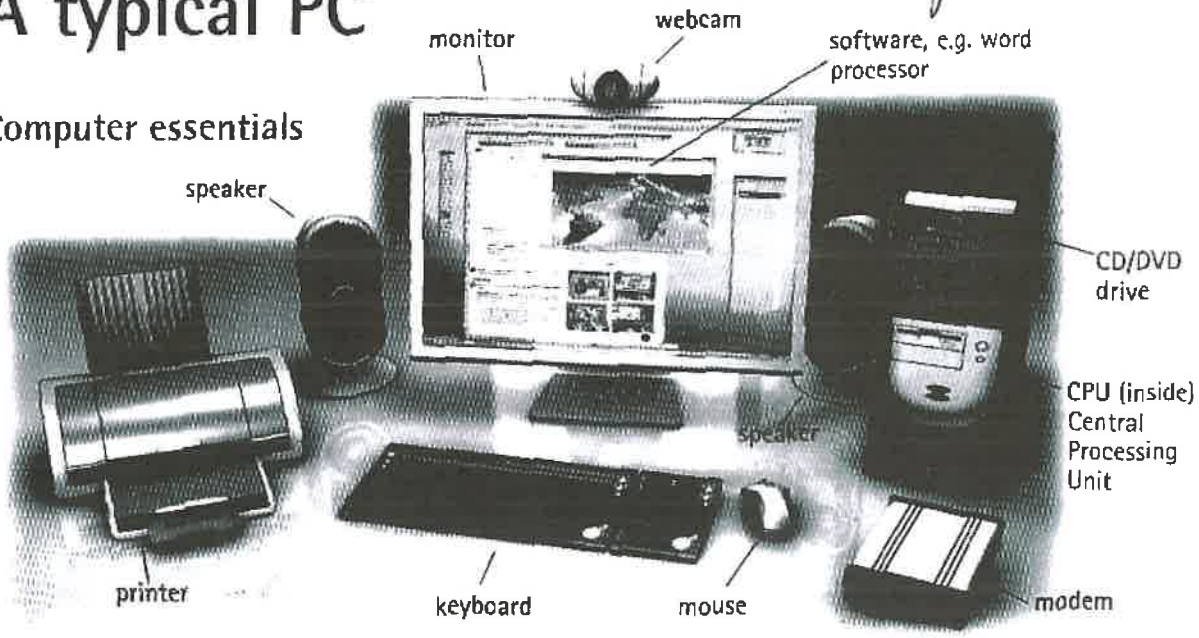
- to **click**, press and release the left button.
- to **double-click**, press and release the left button twice.
- to **drag**, hold down the button, move the pointer to a new place and then release the button.
- to **right-click**, press and release the right button; this action displays a list of commands.

D Voice input

Today you can also interact with your computer by voice with a **voice-recognition system** that converts voice into text, so you can dictate text directly onto your word processor or email program. You can also control your PC with voice commands; this means you can launch programs, open, save or print files. Some systems let you search the Web or chat using your voice instead of the keyboard.

2 A typical PC

A Computer essentials



B Parts of a computer

A computer is an electronic machine that accepts, processes, stores and outputs information. A typical computer consists of two parts: hardware and software.

Hardware is any electronic or mechanical part of the computer system that you can see or touch.

Software is a set of instructions, called a program, which tells a computer what to do.

There are three basic hardware sections.

1 The CPU is the heart of the computer, a microprocessor chip which processes data and coordinates the activities of all the other units.

2 The **main memory** holds the instructions and data which are being processed by the CPU. It has two main sections: **RAM** (random access memory) and **ROM** (read only memory).

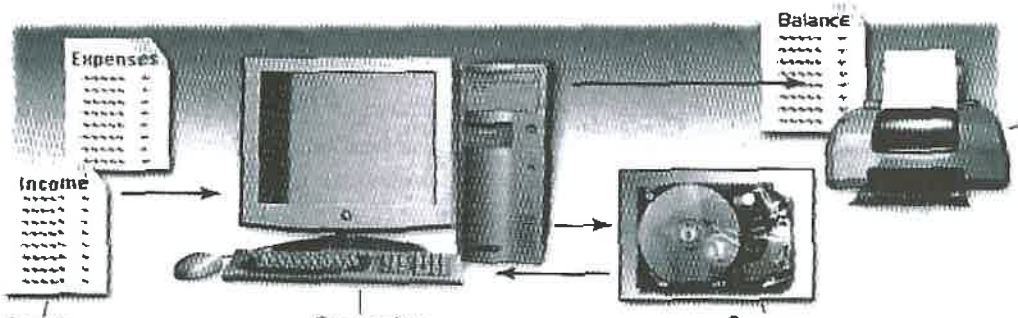
3 **Peripherals** are the physical units attached to the computer. They include:
Input devices, which let us enter data and commands (e.g. the keyboard and the mouse).
Output devices, which let us extract the results (e.g. the monitor and the printer).
Storage devices, which are used to store information permanently (e.g. hard disks and DVD-RW drives).
Disk drives are used to read and write data on disks.

At the back of a computer there are **ports** into which we can plug external devices (e.g. a scanner, a modem, etc.). They allow communication between the computer and the devices.


USB connector


USB ports

C Functions of a PC: input, processing, output, storage



Input
We enter data with a keyboard, a webcam, etc.

Processing
The data is manipulated according to program instructions.

Storage
We keep data and programs in memory systems where they are available for processing.

Output
We can see the result on the screen or in printed form.