* **Definition of a network and its main characteristics**

Network - is a group of two or more computers or other electronic devices that are interconnected for the purpose of exchanging data and sharing resources.

* **Classification of networks based on size and scope**

There are different network types that depend on how large they are and how much of an area they cover geographically, for example:

PAN (personal area network). It is the type of network that is used on a personal level.

LAN (local area network). A local area network is a group of devices such as computers, servers, printers which are located in the same building.

MAN (metropolitan area network). A network that spans over several buildings in a city or town and is connected using a high-speed connection such as fiber optic cable.

WAN (wide area network). It is a network that spans over a large geographical area such as a country continent or even the entire globe.

* **Communication channels and their main types**

A communication channel is the medium used to transport information fron one network device to another. Data transmitted over a communication channel usually takes the form of an electromagnetic signal- waves of light, electricity or sound. These wwaves can travel through the air or

Wired channels

Wired networks are more difficult to install, but they are cheaper, faster and more reliable.

An example of a wired network technology is Ethernet.

Wireless channels

Wireless networks let you move, from one access point to another, but they are less secure and subject to interference.

These are the main types of wireless networks:

Satellites - for long distances;

Wi-Fi - for medium-range distances;

Bluetooth - for short distances;

* **Network topology, network architecture**

There are 5 main types of network topology^

Full mesh/ A full mesh topology connects each network device to many other network devices. Data travelling on a mesh network can take any of several possible paths from its sourse to its destination.

Point-to-point/ When periphreals devices connect to a host device using expantion ports, usb cables or Bluetooth, these connection are the example of p2p topology

Star/ A network arranged as a star topology features a central connection point for all workstations and peripherals. The central connection point is not nessesarily a server. More typically it is a network device called a hub.

Bus/ A bus topology uses a common backbone functions as a shared communication link, which carries network data.

Partial mesh/ In a partial mesh topology, some of the devices are connected to many devices together, but other devices are connected only to 1 or 2 devices.

Client-server network – it is computer network that use a special computer to store data, manage/provide resources and control user access.

The server acts as a central point on the network to which other computers connect. A computer that connects to the server is called a client.

Peer-to-peer network – it is a network in which there are no special servers.

* **Network protocols**

Network protocols – it is a set of rules for efficient data transfer from one network node to another.

For example:

IRC (Internet Relay Chat) - It transmits text messages in real time between online users.

Transmission Control Protocol (TCP) - It is designed to control the transmission of Internet data.

* **Cloud computing**

Concerning cloud computing is made possible by a technology called virtualization. Virtualization allows you to create a "virtual" computer or virtual machine which behaves as if it were a physical computer. By running multiple virtual machines simultaneously, multiple virtual "servers" can run on a single server. Even if individual servers go down, cloud servers as a whole should always be available. The purpose of the cloud computing is to keep information save not overloading a personal computer.

* The internet and the web
* Types of the internet protocols
* Technologies and components of the WWW
* Types of communication media: dial-up, DSL, ADSL, cable, 3G\4G
* Definition and applications of the IoT
* IoT ecosystem
* Benefits that the IoT brings
* Problems related to the IoT and their solutions
* Future of the IoT