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Ethical Hacking Module-1

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Q-1 Difference between hardware and software

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Hardware	Software
- Physical elements of a computer or electronic system.	A collection of instructions that tells the computer how to perform a task.
- Has four main categories input devices, output devices, secondary storage devices and internal components.	Mainly devided into System software and application software.
- Tangible	Intangible
- Developed using electronic and other materials.	Developed by writing instructions using a programming language.
- When damaged, it can be replaced with a new component.	When damaged, it can be reinstalled using a backup copy.
- Example:- keyboard, mouse, Monitor, Printer, etc.	Example:- MS word, Excel, photoshop, etc.

Q-2 Define IP address range and private address range.

→ Private address range

Class	Start Address	Finish Address
A	10.0.0.0	10.255.255.255
B	172.16.0.0	172.31.255.255
C	192.168.0.0	192.168.255.255

→ Public address range

Class	Start Address	Finish Address
A	0.0.0.0	126.255.256.255
B	128.0.0.0	191.255.255.255
C	192.0.0.0	223.255.255.255
D	224.0.0.0	239.255.255.255
E	240.0.0.0	254.255.256.255

Q-3 Explain Network protocol and port number.

→ Network protocols are a set of rules outlining how connected devices communicate across a network to exchange information easily and safely. Protocols serve as a common language for devices to enable communication irrespective of differences in software, or hardware.

→ A port number is a way to identify a specific process to which an internet or other network message is to be forwarded when it arrives at a server. All network-connected devices come equipped with standardized ports that have an assigned number. These numbers are reserved for certain protocols and their associated function. Hypertext Transfer Protocol (HTTP) messages, for example, always go to port 80 :- One of the most commonly used ports.

Q-4 Explain Types of Network Devices?

→ Network devices are hardware components that facilitate connection establishment and control network traffic between devices within a computer network.

1) Switch :-

Switches serve as networking devices that function at the data link layer of the OSI model. The main purpose of switches is to connect end devices within a network and allow the forwarding of data packets utilizing their MAC addresses.

2) Bridges :-

Bridges are also a type of networking device that operates at the data link layer of the OSI model. Their primary role is to connect segments within a network and enable the forwarding of data packets based on their corresponding MAC addresses.

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3) Router :-

Routers are also networking devices that operate at the network layer (layer 3) of the OSI model. The main function of the router is to connect networks and allow the forwarding of data packets based on their respective IP addresses.

There are many types of routers in computer networking. Some of the common routers are :-

- Edge Routers
- Access Routers
- Core Routers
- Brouters
- Wireless Routers

4) Repeater :-

Repeaters are sometimes also known as "Signal Booster". The main function of the repeater is to regenerate an incoming signal from the sender before retransmitting it to the receiver. The layer at which it operates is the physical layer of the OSI model.

5) Gateway :-

Gateways are intermediary devices that usually operate at the network layer of the OSI model and are responsible for connecting networks that are using different protocols or architectures. They do so by translating or converting data formats or protocols between different networks.

6) Hubs :-

Hubs are intermediary devices that usually operate at the physical layer (layer 1) of the OSI model that connect multiple devices on a local network. Hubs function by broadcasting data to all the devices that are connected to it.

7) Modem :-

Modems are the network devices that usually operate at the physical layer (layer-1) of the OSI model. These devices can modulate or demodulate analog signals into digital signals or vice-versa.

There are different types of modems. Some of these are:-

- Optical Modem
- Cable Modem
- Dial Modem
- Satellite Modem

2) Firewall :-

A firewall is an intermediary device that operates at various layers of the OSI model depending on its type. It can be either hardware or software, and its main purpose is to protect the network from any unauthorized access or malicious attacks by enforcing policies or rules.

There are various types of firewall. Some of these are :-

- Proxy firewall
- Stateful inspection firewall
- Unified threat management firewall
- Next generation firewall
- Threat-focused next generation firewall

q) NIC :-

NIC stands for Network Interface card and operates at the data link layer (Layer 2) of the OSI model. It is a hardware component that is responsible for enabling a device to connect to a network. A NIC also has one or more ports that allow different types of cables or wireless signals to connect to the network.