1.**write the network terminologies with example.**

**IP Address:**An IP (Internet Protocol) address is a unique numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication.

Example: 192.168.1.1

**DNS** (Domain Name System):DNS is a decentralized naming system for computers, services, or other resources connected to the Internet or a private network. It translates domain names to IP addresses.

Example: Translating "google.com" to its corresponding IP address

**Firewall**:A firewall is a network security device or software that monitors and controls incoming and outgoing network traffic based on predetermined security rules.

Example: Palo Alto Networks Next-Generation Firewall

**Switch**:A switch is a networking device that connects devices together on a local area network (LAN) and uses packet switching to forward data to the destination device.

Example: Cisco Catalyst 2960 Series Switch

**Router**:A router is a networking device that forwards data packets between computer networks. It connects multiple networks together.

Example: Cisco ISR 4000 Series Router

**LAN** is LOCAL AREA NETWORK which covers smaller area or region such as a building, house, or institution, etc.

**WAN** is WIDE AREA NETWORK that covers larger area such as a city or a country, etc.

**MAN** is a METROPOLITAN AREA NETWORK, that covers area larger than LAN but smaller than WAN.

**VPN** is a VIRTUAL PRIVATE NETWORK that allows user to access the resources and services securely from remote area.

2.**Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.**

Internet

↓

Router

(192.168.1.1)

↓

Switch

(192.168.1.2)

↓

Laptop

(192.168.1.3)

↓

RPS Lab Env

(via VPN)

To access the RPS Lab environment, I follow these steps:

Connect to my home network using my laptop.

Establish a VPN connection to the RPS Lab environment.

Once connected, I can access the RPS Lab environment as if I were directly connected to the lab network.

The network topology diagram above shows the physical and logical connections between devices in my home network. The router connects to the internet and provides a gateway for devices on the network to access the internet. The switch connects multiple devices to the router, allowing them to communicate with each other and access the internet. My laptop connects to the switch and uses a VPN client to establish a secure connection to the RPS Lab environment.

To access the Network Topology tab in the RPS Lab environment, I follow these steps:

From the navigation bar, click Environments.

Click the Environments tab, which displays a list of environments I have access to.

Click the name of the environment, which displays the Environment details page.

Click the Network Topology tab.

The Network Topology tab provides a visual map of the networks and VM network connections in the environment, including the name, subnet, and subnet size for each network, along with the VMs connected to that network.

3.**Identify a real-world application for both parallel computing and networked systems. Explain how these technologies are used and why they are important in that context.**

**Real-World Application**: Online Marketplace

An online marketplace like Amazon, eBay, or Alibaba utilizes both parallel computing and networked systems extensively in its operations.

**Parallel Computing**:

In an online marketplace, parallel computing is used for various tasks such as processing large-scale data analytics, recommendation systems, and handling concurrent user requests. For example, when a user searches for a product on Amazon, the platform needs to quickly retrieve relevant results from a massive database of products.

**Networked Systems**:

Networked systems play a crucial role in connecting buyers and sellers, facilitating transactions, and enabling communication between various components of the online marketplace ecosystem.

**Importance**:

1. **Scalability**: Parallel computing and networked systems enable online marketplaces to scale their infrastructure dynamically to handle increasing traffic, transactions, and data volume efficiently..

2. **Personalization**: By leveraging parallel computing for data analytics and networked systems for real-time communication, online marketplaces can offer personalized shopping experiences to users.

3. **Security**: Parallel computing and networked systems incorporate robust security measures to protect sensitive user data, financial transactions, and the integrity of the marketplace platform.