1. **What is a VPC in AWS?**

   A Virtual Private Cloud (VPC) is a logically isolated section of the AWS cloud where you can launch AWS resources in a virtual network that you define.

2. **What is the default VPC in AWS?**

   The default VPC is automatically created for each AWS account, providing default settings that enable you to launch EC2 instances without requiring any custom configuration.

3. **What is a CIDR block?**

   CIDR (Classless Inter-Domain Routing) block is a range of IP addresses assigned to a VPC. It is specified when creating a VPC and defines the IP range for the VPC.

4. **What is a subnet?**

   A subnet is a segment of a VPC's IP address range where you can place EC2 instances, databases, or other resources. Subnets can be public or private.

5. **What is the difference between public and private subnets?**

   A **public subnet** is one that has a route to the internet via an Internet Gateway (IGW). A **private subnet** does not have direct access to the internet.

6. **What is an Internet Gateway (IGW)?**

   An Internet Gateway is a gateway that allows communication between instances in a VPC and the internet. It is required for instances in a public subnet to access the internet.

7. **What is a NAT Gateway?**

   A NAT (Network Address Translation) Gateway enables instances in a private subnet to connect to the internet while preventing inbound internet traffic.

8. **What is VPC Peering?**

   VPC Peering is a connection between two VPCs that allows them to route traffic to each other. Peering can be within the same AWS region or across regions.

9. **What is a VPC Route Table?**

   A Route Table is used to define how traffic is directed within a VPC, such as directing traffic to an Internet Gateway, NAT Gateway, or other subnets.

10. **What is the maximum CIDR block size for a VPC?**

    The maximum CIDR block size for a VPC is /16, which provides up to 65,536 IP addresses.

11. **What is an Elastic IP (EIP)?**

An Elastic IP is a static IPv4 address designed for dynamic cloud computing. It can be associated with EC2 instances or network interfaces in your VPC.

12. **What is a VPC Flow Log?**

VPC Flow Logs capture information about the IP traffic going to and from network interfaces in your VPC, which is useful for monitoring and troubleshooting network traffic.

13. **What is the role of Security Groups in VPC?**

Security Groups act as virtual firewalls to control inbound and outbound traffic to EC2 instances. They operate at the instance level.

14. **What is a Network Access Control List (NACL)?**

A NACL is a stateless firewall for controlling traffic to and from subnets within a VPC. NACLs operate at the subnet level.

15. **What is the maximum number of VPCs you can create in a region?**

By default, AWS allows you to create up to five VPCs per region. However, this limit can be increased by submitting a request to AWS support.

16. **What is AWS Direct Connect?**

AWS Direct Connect provides a dedicated network connection from your premises to AWS, offering faster and more secure data transfer than using the internet.

17. **What is a Virtual Private Gateway?**

A Virtual Private Gateway is the VPN concentrator on the AWS side of a VPN connection, enabling secure communication between your VPC and your on-premises network.

18. **What is a Transit Gateway?**

AWS Transit Gateway is a service that connects VPCs, on-premises networks, and other AWS services via a central hub, simplifying network architecture and management.

19. **What are the advantages of using multiple Availability Zones (AZs) in VPC?**

Multiple AZs provide high availability, fault tolerance, and redundancy for applications running in a VPC by distributing resources across geographically separate data centers.

20. **How does AWS ensure the security of resources in a VPC?**

    AWS ensures security by using features like Security Groups, Network ACLs, private subnets, VPC

    Flow Logs, and encryption. These features help control access and monitor traffic.

21. **What is the difference between a VPC and a VPN?**

    A VPC is a virtual network within AWS that hosts resources, while a VPN (Virtual Private Network)

    is a secure, encrypted connection between a VPC and an on-premises network.

22. **What is a Customer Gateway in AWS?**

    A Customer Gateway is a physical or software appliance located on your on-premises network

    that allows communication with AWS via VPN.

23. **What is the maximum number of IP addresses you can assign to an EC2 instance in a VPC?**

    By default, you can assign one private IP address per network interface, but you can assign

    additional secondary IP addresses (up to 5 per ENI) depending on the instance type.

24. **Can a VPC span multiple regions?**

    No, a VPC is region-specific and cannot span across multiple regions. However, you can connect

    VPCs from different regions using VPC Peering or AWS Transit Gateway.

25. **What is the purpose of AWS PrivateLink in a VPC?**

    AWS PrivateLink allows you to securely access services hosted on AWS via private IP addresses,

    without exposing traffic to the public internet.

26. **What are Elastic Network Interfaces (ENIs)?**

    Elastic Network Interfaces are virtual network interfaces that can be attached to EC2 instances.

    They are used to manage IP addresses and network connections.

27. **What is a VPC Endpoint?**

    A VPC Endpoint enables private connectivity between your VPC and supported AWS services

    without requiring an internet gateway, NAT device, or VPN connection.

28. **What is the purpose of AWS Lambda in a VPC?**

    AWS Lambda can run code within a VPC, enabling Lambda functions to securely access resources

    in private subnets.

29. **What is a subnet's Availability Zone?**

An Availability Zone (AZ) is a distinct location within a region that is engineered to be isolated from failures in other AZs. Subnets are created in a specific AZ.

30. **How can you connect your on-premises data center to a VPC?**

You can use AWS Direct Connect or VPN to create secure connections between your on-premises data center and a VPC