**Multiple Choice Questions**

1. Which layer provides services to allow end devices to exchange data? a) Transport Layer b) Network Layer c) Data Link Layer d) Physical Layer

**Correct Answer: b) Network Layer**

1. What are the two principal network layer communication protocols? a) TCP and UDP b) HTTP and HTTPS c) IPv4 and IPv6 d) ICMP and ARP

**Correct Answer: c) IPv4 and IPv6**

1. Which of the following is NOT one of the four basic operations performed by the network layer? a) Addressing end devices b) Encapsulation c) De-encapsulation d) Error Correction

**Correct Answer: d) Error Correction**

1. IP encapsulates which layer's segment? a) Physical layer b) Data link layer c) Transport layer d) Application layer

**Correct Answer: c) Transport layer**

1. Which characteristic of IP means it does not establish a connection with the destination before sending the packet? a) Best Effort b) Media Independent c) Connectionless d) Unreliable

**Correct Answer: c) Connectionless**

1. Which characteristic of IP means it does not guarantee delivery of the packet? a) Connectionless b) Media Independent c) Best Effort d) Reliable

**Correct Answer: c) Best Effort**

1. IP is described as "media independent" because: a) It only works over wireless media. b) It does not concern itself with the type of frame or media type at the physical layer. c) It requires a specific type of cabling for delivery. d) It only supports fiber optic connections.

**Correct Answer: b) It does not concern itself with the type of frame or media type at the physical layer.**

1. What is fragmentation in the context of IPv4 packets? a) When Layer 2 splits the packet into smaller units. b) When Layer 3 splits the IPv4 packet into smaller units. c) When a router combines smaller packets into a larger one. d) When an IPv6 packet is converted to IPv4.

**Correct Answer: b) When Layer 3 splits the IPv4 packet into smaller units.**

1. Which of the following is a limitation of IPv4 addressed by IPv6? a) Too much end-to-end connectivity b) IPv4 address abundance c) Increased network complexity due to NAT d) Lack of header fields

**Correct Answer: c) Increased network complexity due to NAT**

1. What is the address space of an IPv6 address? a) 32 bits b) 64 bits c) 128 bits d) 256 bits

**Correct Answer: c) 128 bits**

1. What is the fixed header size of an IPv6 packet? a) 20 Bytes b) 32 Bytes c) 40 Bytes d) 64 Bytes

**Correct Answer: c) 40 Bytes**

1. Which of the following IPv4 header fields was removed in IPv6 to improve performance? a) Version b) Source Address c) Header Checksum d) Destination Address

**Correct Answer: c) Header Checksum**

1. Unlike IPv4, which packets do routers NOT fragment? a) UDP packets b) TCP segments c) IPv6 packets d) ICMP packets

**Correct Answer: c) IPv6 packets**

1. What does a host device create to send packets? a) A subnet mask b) A default gateway c) Its own routing table d) A DNS entry

**Correct Answer: c) Its own routing table**

1. If a destination is on the same LAN, it is considered a: a) Remote Host b) Local Host c) Default Gateway d) Directly Connected Network

**Correct Answer: b) Local Host**

1. What is a router that is part of the LAN and used as a "door" to other networks called? a) DNS Server b) Default Gateway c) DHCP Server d) Web Server

**Correct Answer: b) Default Gateway**

1. On Windows, which command can be used to display the PC routing table? a) ipconfig b) ping c) route print d) tracert

**Correct Answer: c) route print**

1. Which type of route entry is automatically added to a router's routing table if the interface is active and has addressing? a) Remote routes b) Default route c) Static routes d) Directly Connected routes

**Correct Answer: d) Directly Connected routes**

1. How are static routes configured? a) Dynamically by a routing protocol. b) Automatically by the router. c) Manually by an administrator. d) Through DHCP.

**Correct Answer: c) Manually by an administrator.**

1. What is a characteristic of dynamic routing? a) Routes must be adjusted manually when topology changes. b) It is good for small non-redundant networks. c) It automatically discovers remote networks and maintains up-to-date information. d) It cannot share default routes with other routers.

**Correct Answer: c) It automatically discovers remote networks and maintains up-to-date information.**

**Fill in the Blanks:**

1. The Network Layer provides services to allow

**end devices** to exchange data.

1. IP version 4 (IPv4) and IP version 6 (IPv6) are the principle

**network layer** communication protocols.

1. The network layer performs four basic operations: Addressing end devices, Encapsulation,

**Routing**, and De-encapsulation.

1. IP encapsulates the

**transport layer** segment.

1. IP is

**connectionless** because it does not establish a connection with the destination before sending the packet.

1. IP is

**best effort** because it will not guarantee delivery of the packet.

1. IP is

**media independent** and can be sent over any media type: copper, fiber, or wireless.

1. **Fragmentation** is when Layer 3 splits the IPv4 packet into smaller units.
2. IPv6 was developed by the

**Internet Engineering Task Force (IETF)**.

1. IPv6 provides an

**increased address space** based on a 128-bit address.

1. IPv6 eliminates the need for

**NAT** due to the huge amount of addressing available.

1. The IPv6 header is fixed at

**40 Bytes** long.

1. Packets are always created at the

**source** device.

1. A host can send packets to itself,

**local hosts**, or **remote hosts**.

1. If a device has no default gateway or a bad default gateway, its traffic will not be able to

**leave the LAN**.

1. The

**routing table** contains a list of all known network addresses (prefixes) and where to forward the packet.

1. The router uses the

**longest subnet mask** or prefix match.

1. **Static routes** must be configured manually and adjusted manually by the administrator when there is a change in the topology.
2. Dynamic routes automatically

**discover remote networks** and maintain up-to-date information.

1. The

show ip route command shows route sources such as **L** (Directly connected local interface IP address), **C** (Directly connected network), **S** (Static route), **O** (OSPF), and **D** (EIGRP).

Sources