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| Swayam |
| **Computer Networks and Internet Protocol** |
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# **Week – 01: Introduction to Computer Network**

# **Week – 06**

## Lecture 26: Network Layer I – Introduction

Topics to be Covered:

* Network Layer Service
* Internet Architecture
* Autonomous System

## Lecture 27: IP Addressing (IPv4) I – Classful Addressing

Topics to be Covered:

* Classful Addressing
* Network Address and Host Address
* Subnets

## Lecture 28: IP Addressing (IPv4) II – CIDR

Topics to be Covered:

* Classless Addressing
* Classless Inter Domain Routing

## Lecture 29: IP Addressing (IPv4) III – Network Address Translation

Topics to be Covered:

* Network Address Translation
* NAT Architecture
* Port based NAT

## Lecture 30: IPv6 Addressing

Topics to be Covered:

* IP version 6
* Basic changes and functionalities of IPv6

## Quiz

### 2025

**Q. 1 What is the primary function of the network layer in the TCP/IP model?**

A) Establish end-to-end connections between nodes.

B) Ensure reliable data transfer between devices.

C) Handle logical addressing and routing of data.

D) Encrypt and decrypt data for secure transmission.

**Q. 2 Which of the following is a key advantage of using a Layer 3 switch over a Layer 2 switch?**

A) It reduces the need for VLANs.

B) It improves network performance by enabling faster switching at Layer 1.

C) It can route traffic between different subnets without requiring a separate router.

D) It only supports static routing.

**Q. 3 Which of the following is NOT typically offered by an ISP?**

A) Email hosting services.

B) Web hosting services.

C) Content creation for websites.

D) Virtual Private Network (VPN) services.

**Q. 4 In a network communication scenario involving an Internet Service Provider (ISP), which of the following is responsible for determining the most efficient path for packet delivery?**

A) Transport Layer

B) Network Layer

C) Data Link Layer

D) Application Layer

**Q. 5 When communicating between two nodes, what role does the transport layer protocol play**

A) Routing the data packets.

B) Providing IP logical addressing to the communicating devices.

C) Ensuring reliable or fast data delivery based on protocol choice.

D) Forwarding the data to the next hop through LAN.

**Q. 6 What type of address is "0.0.0.0" in IPv4?**

A) Loopback address

B) Default route address

C) Broadcast address

D) Unspecified address

**Q. 7 What is the significance of CIDR notation in IP addressing?**

A) To replace the traditional classful addressing system with a more flexible and efficient way of allocating IP addresses.

B) To enhance encryption during transmission.

C) To improve the speed of DNS resolution.

D) To allocate MAC addresses dynamically.

**Q. 8 How many subnets can be created from a /24 network if the subnet mask is extended to /26?**

A) 2

B) 4

C) 6

D) 16

**Q. 9 What is the CIDR notation for a supernet that aggregates 192.168.0.0/24 and 192.168.1.0/24?**

A) \23

B) \24

C) \25

D) \22

**Q. 10 In a home network using NAT, how does a router differentiate between multiple devices accessing the same web server?**

A) By assigning unique public IP addresses to each device.

B) By using different MAC addresses for each device.

C) By assigning unique port numbers for each session.

D) By encrypting the IP packets.

**Answers: -**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **C** | **C** | **C** | **B** | **C** | **D** | **A** | **B** | **A** | **C** |

# **Appendix 01: - Important Links**

2025: - <https://onlinecourses.nptel.ac.in/noc25_cs15/preview>

2024: - <https://onlinecourses.nptel.ac.in/noc24_cs19/preview>

2020: - <https://onlinecourses.nptel.ac.in/noc20_cs23/preview>