

# **SHRIMATI INDIRA GANDHI COLLEGE**

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**Thiruchirappalli**

**QUESTION BANK**

**COMPUTER NETWORKS**



**DEPARTMENT OF COMPUTER  
SCIENCE, INFORMATION TECHNOLOGY AND  
COMPUTER APPLICATIONS**



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# Computer Networks

## **CORE COURSE VI COMPUTER NETWORKS**

### **Objective:**

To understand the Design and Organization of Computer Networks

### **Unit I**

Overview and Physical Layer: Introduction: Data Communications - Networks - Network Types, Network Models: TCP/IP Protocol Suite- The OSI Model, Bandwidth utilization : Multiplexing- Spread Spectrum, Transmission Media: Guided Media-Unguided Media, Switching: Circuit Switched Network-Packet Switching-Structure of a switch

## **Unit II**

Data Link Layer: Error Deduction and Correction : Introduction- Cyclic codes- Forward error correction, Data link Control: Data link layer protocols- Media Access Control: Random Access- Controlled Access, Wireless Networks: IEEE 802.11- Bluetooth-Cellular Telephone- Satellite network- Connection devices,

## **Unit III**

Network Layer Services : Packet Switching- Network layer performance- IPV4 Addresses- Internet Protocol-Routing Algorithms - IPV6 Addressing

## **Unit IV**

Transport Layer : Transport Layer Protocols- User Datagram Protocol - TCP:TCP Services TCP features - Windows in TCP - Flow Control - Error Control- TCP Congestion Control - TCP timers

## **Unit V**

Application Layers : Client Server Programming - Word Wide Web & HTTP - FTP - Email - DNS

### **Text Book:**

1. Data Communications and Networking, Behrouz A Forouzan, Tata McGraw Hill, Fifth Edition, 2013.

### **Reference Book:**

1. Data Communications and Networks, Achyut Godbole and Atul Kahate, McGraw Hill Education, 2011.

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## Computer Networks

### **UNIT-1 – Overview and Physical Layer**

#### **1. What is Computer Networks?**

A **computer network** is a set of **computers** connected together for the purpose of sharing resources. The most common resource shared today is connection to the **Internet**. Other shared resources can include a printer or a file server. The **Internet** itself can be considered a **computer network**.

#### **2. Define Data communication.**

- It is the process of using computing and **communication** technologies to **transfer data** from one place to another, and vice versa.
- It enables the movement of electronic or digital **data** between two or more nodes, regardless of geographical location, technological medium or **data** contents.

#### **3. What are the fundamentals of Data communications?**

- Data communications system depends on four fundamental characteristics:
- **Delivery, accuracy, timeliness, and jitter.**
- Received by the intended device or user and only by that device or user.
- Altered in transmission and left uncorrected are unusable.

#### **4. List out the components of Data Communication.**

- Message.
- Sender.
- Receiver.
- Medium (Communication Channel)
- Encoder & Decoder.

#### **5. Mention the different Types of**

**Networks.** Types of Networks in Use Today

- Personal Area Network (PAN) ...
- Local Area Network (LAN) ...
- Wireless Local Area Network (WLAN) ...
- Campus Area Network (CAN) ...
- Metropolitan Area Network (MAN) ...
- Wide Area Network (WAN) ...
- Storage-Area Network (SAN) ...
- System-Area Network (also known as SAN)

#### **6. What is the different form of data representation?**

Types of data representation

- Decimal number system.
- Binary number system.
- Octal number system.
- Hexadecimal number system.

#### **7. List out the three types of data flow.**

- Simplex,-One way communication E.g.: radio and television broadcasts
- Half-duplex – data flows in both directions but only one direction at a time on the data communication line. For example, a walkie-talkie
- Full duplex- both parties can communicate with each other simultaneously. An example of a full-duplex device is a telephone

## Computer Networks

### 8. What are the types of topology?

There are five types of topology in computer networks:

- Mesh Topology
- Star Topology
- Bus Topology
- Ring Topology
- Hybrid Topology

### 9. Define Multipoint.

Computer network having more than two terminals connected by a single communications channel

### 10. What is circuit switching network?

- It is a type of network where the communications between end devices (nodes) must be set up before they can communicate.
- Once set up, the **circuit** is dedicated to the two nodes it connects for the duration of that connection. An **example** of a **circuit-switched** network is an analog telephone network.

### 11. What is Internet?

- The **internet** is a globally connected network system that uses TCP/IP to transmit data via various types of media.
- The **internet** is a network of global exchanges – including private, public, business, academic and government networks – connected by guided, wireless and fiber-optic technologies.

### 12. List out the layers in TCP/IP.

The TCP/IP model consists of five layers:

- The application layer, transport layer, network layer, data link layer and physical layer.

### 13. What are the layers in OSI reference model?

Functions of the OSI Layers

- Physical Layer.
- Data-Link Layer.
- Network Layer.
- Transport Layer.
- Session Layer.
- Presentation Layer.
- Application Layer.

### 14. What do you mean by encapsulation in networking?

- Encapsulation is the process of taking data from one protocol and translating it into another protocol, so the data can continue across a network.
- For example, a TCP/IP packet contained within an ATM frame is a form of encapsulation

### 15. Define Decapsulation in networks.

- Decapsulation is the process of opening up encapsulated data that are usually sent in the form of packets over a communication network.
- It can be literally defined as the process of opening a capsule, which, in this case, refers to encapsulated or wrapped-up data.

### 16. What is Multiplexing?

- **Multiplexing** (sometimes contracted to muxing) is a method by which multiple analog or digital signals are combined into one signal over a shared medium.

## Computer Networks

- The aim is to share a scarce resource. ... The **multiplexed** signal is transmitted over a communication channel such as a cable.

### 17. Define Demultiplexing.

- **Demultiplexing** (Demuxing) is a term relative to multiplexing. It is the reverse of the multiplexing process.
- **Demultiplexing** is a process reconverting a signal containing multiple analog or digital signal streams back into the original separate and unrelated signals.

### 18. Expand:-HTTP, TELNET, SMTP, SNMP.

- HTTP:- Hypertext Transfer Protocol.
- TELNET:-Telecommunication Networks
- SMTP:-Simple Mail Transfer Protocol
- SNMP:- Simple Network Management Protocol.

### 19. What are the categories of Multiplexing?

- There are mainly two **types of multiplexers**, namely analog and digital.
- They are further divided into Frequency Division **Multiplexing** (FDM), Wavelength Division **Multiplexing** (WDM), and Time Division **Multiplexing** (TDM).

### 20. What is FDM?

- Frequency Division Multiplexing (FDM) is a networking technique in which multiple data signals are combined for simultaneous transmission via a shared communication medium.
- FDM uses a carrier signal at a discrete frequency for each data stream and then combines many modulated signals.

### 21. Define TDM.

Time-division multiplexing (**TDM**) is a method of transmitting and receiving independent signals over a common signal path by means of synchronized switches at each end of the transmission line so that each signal appears on the line only a fraction of time in an alternating pattern.

### 22. Define WDM.

- Wavelength division multiplexing (**WDM**) is a technology or technique modulating numerous data streams,
- i.e. optical carrier signals of varying wavelengths (colors) of laser light, onto a single optical fiber.
- **WDM** enables bi-directional communication as well as multiplication of signal capacity.

### 23. What is Spread Spectrum?

- **Spread spectrum** is a technique used for transmitting radio or telecommunications signals.
- The term refers to the practice of spreading the transmitted signal to occupy the frequency **spectrum** available for transmission.

### 24. List out the techniques of Spread Spectrum.

- There are four techniques of spread spectrum namely
- Direct sequence spread spectrum (DSSS),
- Frequency hopping spread spectrum (FHSS),
- Chirp spread spectrum (CSSS) and time
- Hopping spread spectrum (THSS).

### **UNIT-2 – DataLink Layer**

#### **1. List out the types of error.**

Single Bit Error, Burst error

#### **2. Define error detection.**

- Error detection refers to the techniques used to detect noise or other impairments introduced into data while it is transmitted from source to destination.
- Error detection ensures reliable delivery of data across vulnerable networks.

#### **3. What is Hamming Distance?**

- Hamming distance is the number of bit positions in which the two bits are different.
- The Hamming distance between two strings, a and b is denoted as  $d(a,b)$ .
- It is used for error detection or error correction when data is transmitted over computer networks.

#### **4. Define CRC.**

- A cyclic redundancy check (CRC) is an error-detecting code commonly used in digital networks and storage devices to detect accidental changes to raw data.
- Blocks of data entering these systems get a short check value attached, based on the remainder of a polynomial division of their contents.

#### **5. What is checksum?**

- A value used to ensure data are stored or transmitted without error.
- It is created by calculating the binary values in a block of data using some algorithm and storing the results with the data.

#### **6. List out the protocols in Data link Layer.**

- Simple,
- Stop -and -Wait,
- Go-Back-N,and
- Selective-Repeat

#### **7. What are the types of Random Access protocol?**

- ALOHA,
- CSMA,
- CSMA/CD,
- CSMA/CA

#### **8. Expand:-RTS, CTS, NAV, CSMA**

- RTS:-Request to sent.
- CTS:-Clear To Send.
- NAV:-Network Allocation Vector.
- CSMA:-Carrier Sense Multiple Access.

#### **9. What is Bluetooth?**

- Bluetooth is a wireless short-range communications technology standard found in millions of products we use every day
- including headsets, smart phones, laptops and portable speakers.
- A Bluetooth device works by using radio waves instead of wires or cables to connect with your cell phone, smart phone or computer.

#### **10. List out the types of network in Blue tooth.**

Piconet and Seatter



## Computer Networks

### 11. Define MSC.

A mobile switching center (MSC) is the centerpiece of a network switching subsystem (NSS). The MSC is mostly associated with communications switching functions, such as call set-up, release, and routing.

### 12. What is generation in cellular Telephone?

- The first generation (1G) mobile wireless communication network was analog used for voice calls only.
- The second generation (2G) is a digital technology and supports text messaging.
- The third generation (3G) mobile technology provided higher data transmission rate, increased capacity and provide multimedia support.
- 4G is being developed to accommodate the QoS and rate requirements set by forthcoming applications like wireless broadband access,
- Multimedia Messaging Service (MMS),
- video chat, mobile TV, HDTV content,
- Digital Video Broadcasting (DVB), minimal services like voice and data, and other services that utilize bandwidth

### 13. Define Satellite network.

- Satellite Internet is the ability to transmit and receive data from a relatively small satellite dish on Earth and
- communicate with an orbiting geostationary satellite 22,300 miles above Earth's equator

### 14. What are the categories of satellite?

- GEO-Geostationary Earth Orbit
- LEO-Low Earth Orbit
- MEO-Medium Earth Orbit

### 15. Define HUB.

A hub is the most basic networking device that connects multiple computers or other network devices together

### 16. Define router.

- A router is a device that forwards data packets along networks.
- A router is connected to at least two networks.
- Commonly two LANs or WANs or a LAN and its ISP's network.
- Routers are located at gateways, the places where two or more networks connect.

### 17. What is GPS?

- The **GPS** (Global Positioning System) is a "constellation" of approximately 30 well-spaced satellites that orbit the Earth and make it possible for people with ground receivers to pinpoint their geographic location.
- The location accuracy is anywhere from 100 to 10 meters for most equipment.

### 18. Define orbit and List out its types

- An orbit is a regular, repeating path that an object in space takes around another one.
- An object in an orbit is called a satellite.
- A satellite can be natural, like the moon, or human
- Types: **Equatorial-orbit satellite, Inclined-orbit satellite, Polar-orbit satellite**

### 19. Define Token passing.

- On a local area network, token passing is a channel access method where a signal called a token is passed between nodes to authorize that node to communicate.
- In contrast to polling access methods, there is no pre-defined "master" node.

## Computer Networks

### 20. **Expand:-FSM, GPS, L2CAP, GSM**

FSM:-Finite State Machine

GPS:-Global Positioning System

L2CAP:-Logical Link Control and Adaptation Protocol

GSM: - Global System for Mobile Communication

### **UNIT-3 – Network Layer**

#### **1. Define packetizing in Network layer.**

- Packetizing is a process of dividing long messages into smaller ones.
- Definition of packetizing in term of network layer, upper layer, data link layer.
- While receiver, receives those packets from its data-link layer, decapsulates the packet, and pass the data (packets which is received) to the upper-layer protocol.

#### **2. What is mean by Routing?**

- **Routing** is the process of moving packets across a network from one host to another.
- It is usually performed by dedicated devices called **routers**.
- Packets are the fundamental unit of information transport in all modern computer networks, and increasingly in other communications networks as well.

#### **3. Define congestion control.**

Congestion control is a network layer issue, and is thus concerned with what happens when there is more data in the **network** than can be sent with reasonable packet delays, no lost packets, etc. Flow **control** is a local, **congestion control** is global.

#### **4. What do you mean by quality of service?**

- Quality of service (QoS) refers to any technology that manages data traffic to reduce packet loss, latency and jitter on the network.
- **QoS** controls and manages network resources by setting priorities for specific types of data on the network.

#### **5. Define packet switching.**

- Packet switching is a method of grouping data that is transmitted over a digital network into packets.
- Packets are made of a header and a payload.
- Data in the header are used by networking hardware to direct the packet to its destination where the payload is extracted and used by application software

#### **6. What is datagram?**

- A **datagram** is a basic transfer unit associated with a packet-switched **network**.
- **Datagram** provides a connectionless communication service across a packet-switched **network**.
- The delivery, arrival time, and order of arrival of **datagram** need not be guaranteed by the **network**.

#### **7. List out the types of delay in packet switched networks.**

- In **packet** switched **networks**, there are four **types** of commonly identified **delays**.
- Processing, queuing, transmission and propagation **delays**.
- Processing and propagation **delays** are often considered negligible.
- Transmission **delay** is related to transmission rate of an interface.

#### **8. What is throughput computer network?**

- **Throughput** is a measure of how many units of information a system can process in a given amount of time.
- It is applied broadly to systems ranging from various aspects of **computer** and **network** systems to organizations.

#### **9. Define ipv4.**

- It is the fourth revision of the Internet Protocol and a widely used protocol in data communication over different kinds of networks.
- IPv4 is a connectionless protocol used in packet-switched layer networks, such as Ethernet.

## Computer Networks

### 10. What is class full address?

- A Class full **addressing**, the **address** space is divided into five **classes**:
- A, B, C, D, and E. Each of these **classes** has a valid range of IP **addresses**.
- **Classes** C and E are reserved for multicast and experimental purposes respectively. The order of bits in the first octet determines the **classes** of IP **address**.

### 11. What is DHCP protocol in networking?

- A **DHCP Server** is a **network server** that automatically provides and assigns IP addresses, default gateways and other **network** parameters to client devices.
- It relies on the standard **protocol** known as Dynamic Host Configuration **Protocol** or **DHCP** to respond to broadcast queries by clients.

### 12. Describe network addressing resolution protocol.

**Address Resolution Protocol**, a **network** layer **protocol** used to convert an **IP address** into a physical **address** (called a **DLC address**), such as an Ethernet **address**. A host wishing to obtain a physical **address** broadcasts an **ARP** request onto the **TCP/IP network**.

### 13. Define network address translation

- **NAT** translates the **IP addresses** of computers in a local **network** to a single **IP address**. This **address** is often used by the router that connects the computers to the Internet.

### 14. What is IP address with example?

An **IP address** is written in "dotted decimal" notation, which is 4 sets of numbers separated by period each set representing 8-bit number ranging from (0-255). An **example** of **IPv4 address** is 216.3.128.12, which is the **IP address** previously assigned to iplocation.net.

### 15. What is distance vector routing with example?

A **distance-vector routing** (**DVR**) protocol requires that a **router** inform its neighbours of topology changes periodically. Historically known as the old ARPANET **routing** algorithm (or known as Bellman-Ford algorithm). ... Distances, based on a chosen metric, are computed using information from the neighbours' **distance vectors**.

### 16. What is link state routing?

**Link state routing** is a complex **routing** technique in which each **router** shares information with other **routers** about the reachability of other networks and the metric to reach the other networks in order to determine the best path. **Routing** is the process of moving packets across a network from one host to another.

### 17. Define Ipv6.

An Internet Protocol Version 6 **address** (**IPv6 address**) is a numerical label that is used to identify a network interface of a computer or a network node participating in an **IPv6** computer network.

### 18. Describe the three address types of Ipv6.

The **three types of IPv6 addresses** are: unicast, anycast, and multicast.

### 19. Define payload.

- The **payload** is the part of transmitted data that is the actual intended message.
- Headers and metadata are sent only to enable **payload** delivery.
- In the context of a computer virus or worm, the **payload** is the portion of the malware which performs malicious action.

### 20. Describe encrypted security payload.

- It is a protocol within the IPsec for providing authentication, integrity and confidentiality of network packets data/**payload** in IPv4 and IPv6 networks.
- ESP provides message/**payload** encryption and the authentication of a **payload** and its origin within the IPsec protocol suite.

### UNIT-3 – Transport Layer

#### 1. What is main function of transport layer?

- It responsible for end-to-end communication over a network.
- It provides logical communication between application processes running on different hosts within a layered architecture of protocols and other network components.

#### 2. What is FSM in networking?

- It is a computation model that can be used to simulate sequential logic, or, in other words, to represent and control execution flow.
- Finite State Machines can be used to model problems in many fields, including mathematics, artificial intelligence, games or linguistics.

#### 3. What is meant by stop and wait protocol?

- Stop-and-wait ARQ also referred to as alternating bit protocol, is a method in telecommunications to send information between two connected devices.
- It ensures that information is not lost due to dropped packets and that packets are received in the correct order.

#### 4. Why sliding window protocol is better than stop and wait protocol?

- Only one frame is transmitted at a time in the **stop-and-wait protocol** while **sliding window** transmits more **than** one frame at a time.
- The efficiency of the **sliding window protocol** is more **than** the **stop-and-wait protocol** because it produces short propagation delay.

#### 5. What is the purpose of piggybacking?

- **Piggybacking**, in a wireless communications context, is the unauthorized access of a wireless LAN.
- The usual **purpose of piggybacking** is simply to gain free network access rather than any malicious intent, but it can slow down data transfer for legitimate users of the network.

#### 6. What is the difference between TCP and UDP?

- **TCP** (Transmission Control Protocol) is connection oriented, whereas **UDP** (User Datagram Protocol) is connection-less.
- **UDP** does not use acknowledgments at all, and is usually used for protocols where a few lost datagram do not matter.
- Because of acknowledgments, **TCP** is considered a reliable data transfer protocol.

#### 7. What is UDP and how it works?

- **UDP** stands for User Datagram Protocol and is a connectionless network protocol.
- **UDP works** on top of the IP protocol. The data the sender wants to transmit is also append to the datagram.
- The datagram packet is sent and may or may not be delivered to the recipient, **UDP** does not care.

#### 8. Write some advantage of UDP.

- Small packet sizes than TCP by **about 60%**
- **UDP** header 20 bytes.
- TCP header 80 bytes.
- Connectionless: No connection to create and maintain.
- You don't have to create connection first before sending out data.
- You have more control of when data is being sent out.

## Computer Networks

### 9. Write some disadvantage of UDP.

- Data corruption is a common occurrence on the Internet; **UDP** has a primitive form of error detection.
- No compensation for lost packets.
- Packets can arrive out of order.
- No congestion control.

### 10. Describe the segment in UDP.

- **UDP** is a connectionless and unreliable protocol.
- **UDP** does not do flow control, error control or retransmission of a bad **segment**. **UDP** transmits **segments** consisting of an 8-byte header.
- Its contains Source port, Destination port, **UDP** length and Checksum.

### 11. Define UDP checksum.

- It is the complement of a 16-bit one's complement sum calculated over an IP "pseudo-header" and the actual **UDP** data.
- The IP pseudo-header is the source address, destination address, protocol (padded with a zero byte) and **UDP** length.

### 12. Describe congestion window.

- It is a TCP state variable that limits the amount of data the TCP can send into the network before receiving an ACK.
- The Receiver **Window** (rwnd) is a variable that advertises the amount of data that the destination side.

### 13. Describe congestion detection.

- It is a mechanism that generally triggers **congestion** alleviation or control procedure.
- **Congestion** can be **detected** either at the sink node or at the intermediate sensor nodes.
- In either case, the source traffic rate is usually reduced in order to mitigate **congestion** problem from the network.

### 14. What is Timer in TCP?

- **TCP** Timers are used to avoid excessive delays during communication.
- **TCP** Timers are- Time Out **Timer**, Time Wait **Timer**, Keep Alive **Timer**, and Persistent **Timer**.
- Time out **timer** is used for retransmission.
- Time Wait **Timer** is used during connection termination.

### 15. Describe Round-Trip time.

- It is the length of **time** it takes for a signal to be sent plus the length of **time** it takes for an acknowledgement of that signal to be received.
- This **time** therefore consists of the propagation times between the two points of signal.

### 16. Define TCP service.

- The Transmission Control Protocol (**TCP**) is an important transport layer protocol providing a reliable data transfer **service** to support many applications running over the Internet such as the World Wide Web.
- It is therefore important to **define** the intent of **TCP**

### 17. What are persistence timers?

- It deal with a zero-window-size deadlock situation, TCP uses a **persistence timer**.
- When the sending TCP receives an acknowledgment with a window size of zero, it starts a **persistence timer**.
- When the **persistence timer** goes off, the sending TCP sends a special segment called a probe.

## Computer Networks

### 18. Describe Retransmission timer.

- **Retransmission Timer** – To **retransmit** lost segments, TCP uses **retransmission timeout** (RTO). When TCP sends a segment the **timer** starts and stops when the acknowledgment is received.
- If the **timer** expires **timeout** occurs and the segment is **retransmitted**.

### 19. How to measured RTT?

- **RTT** is typically **measured** using a ping — a command-line tool that bounces a request off a server and calculates the time taken to reach a user device.
- Actual **RTT** may be higher than that **measured** by the ping due to server throttling and network congestion.

### 20. Describe congestion policies.

- It is the **policy** in which retransmission of the packets are taken care.
- If the sender feels that a sent packet is lost or corrupted, the packet needs to be retransmitted.
- This transmission may increase the **congestion** in the network.

### **UNIT-3 – Network Layer**

#### **1. Define API.**

- It is a set of routines, protocols, and tools for building software applications.
- Basically, an **API** specifies how software components should interact.
- Additionally, **APIs** are used when programming graphical user interface (GUI) components.

#### **2. What is meant by socket interface?**

- A **socket** is an endpoint of communication to which a name can be bound.
- A **socket** has a type and one associated process.
- The **interface** to network protocols needs to accommodate multiple communication protocols, such as TCP/IP, Xerox internet protocols (XNS), and UNIX family.

#### **3. What is the difference between network layer and transport layer?**

- Difference between Network Layer and Transport Layer.
- The basic **difference between network layer and transport layer** is that **transport layer protocol** provides logical communication **between** processes running on **different** hosts, whereas **network layer protocol** provides logical communication **between** hosts.

#### **4. What is local socket addressing?**

- **Local socket address**, consisting of the **local IP address** and (for TCP and UDP, but not IP) a port number. protocol:
- A transport protocol, e.g., TCP, UDP, raw IP.
- A **socket** that has been connected to another **socket**, e.g., during the establishment of a TCP connection, also has a remote **socket address**.

#### **5. What is difference between port and socket?**

- A **port** is a logical connection method two end points communicate with.
- **Ports** operate at the Transport layer of the OSI.
- **Sockets** are determined by an IP address and **port** number.
- For example, for a VPN client to connect the client would need to use the **socket** determined by the **port** number and IP of the local client.

#### **6. What do you mean by Remote socket addressing?**

- This **means** that (local or **remote**) endpoints with TCP port 53 and UDP port 53 **are** distinct **sockets**, while IP **does** not have ports.
- A **socket** that has been connected to another **socket**, e.g., during the establishment of a TCP connection, also has **are mote socket address**.

#### **7. Describe concurrent communication.**

- **Concurrent** execution of code allows for **communication** between the parts of code that are executed **concurrently**.
- The **communication** can be done either through models using shared memory or by models using message passing.

#### **8. What is WWW in computer networks?**

- The Internet is a global system of interconnected **computer networks**.
- In contrast, the World Wide Web is a global collection of documents and other resources, linked by hyperlinks and URIs.



## Computer Networks

### 9. Describe web client and web server.

- The **client-server** characteristic **describes the relationship** of cooperating programs in an application.
- The **server** component provides a function or service to one or many **clients**, which initiate requests for such services. ... For example, a **web server** serves **web** pages and a file **server** serves computer files.

### 10. Define URL in computer network.

- A Uniform Resource Locator (**URL**), colloquially termed a web address, is a reference to a web resource that specifies its location on a **computer network** and a mechanism for retrieving it.
- A **URL** is a specific type of Uniform Resource Identifier (URI), although many people use the two terms interchangeably.

### 11. What is HTTP and why it is used?

- **HTTP** means Hyper Text Transfer Protocol.
- **HTTP** is the underlying protocol **used** by the World Wide Web and this protocol defines how messages are formatted and transmitted, and what actions Web servers and browsers should take in response to various commands.

### 12. What you mean by host?

- A **host** (also known as "network **host**") **is** a computer or other device that communicates with other **hosts** on a network.
- **Hosts** on a network include clients and servers -- that send or receive data, services or applications.

### 13. What is a port on a computer?

- When referring to a physical device, a hardware **port** or peripheral **port** is a hole or connection found on the front or back of a **computer**.
- **Ports** allow **computers** to access external devices such as printers.

### 14. How many types of ports are there?

- In Computers, communication **ports** can be divided into two **types** based on the **type** or protocol used for communication.
- They are Serial **Ports** and Parallel **Ports**.

### 15. What are FTP and its uses?

- **FTP** is an acronym for File Transfer Protocol.
- As the name suggests, **FTP** is used to transfer files between computers on a network.
- You can **use FTP** to exchange files between computer accounts, transfer files between an account and a desktop computer, or access online software archives.

### 16. Describe electronic mail.

- **Email** is information stored on a computer that is exchanged between two users over telecommunications.
- More plainly, **e-mail** is a message that may contain text, files, images, or other attachments sent through a network to a specified individual or group of individuals.

### 17. What are the features of electronic mail?

- Attachment: Ability to attach the files along the messages is one of most useful **features of email**.

## Computer Networks

- (2)Address book: It is also most important **features of email** that allows a user to storing the information.

### 18. What is SMTP and how it works?

- **SMTP** is part of the application layer of the TCP/IP protocol.
- Using a process called "store and forward," **SMTP** moves your email on and across networks.
- It **works** closely with something called the Mail Transfer Agent (MTA) to send your communication to the right computer and email inbox.

### 19. Describe MIME.

- The **MIME** stands for Multi-Purpose Internet Mail Extensions.
- As the name indicates, it is an extension to the Internet email protocol that allows its users to exchange different kinds of data files over the Internet such as images, audio, and video.
- The **MIME** is required if text in character sets other than ASCII.

### 20. Define DNS.

- **DNS**. (Domain Name System) The Internet's system for converting alphabetic names into numeric IP addresses.
- For example, when a Web address (URL) is typed into a browser, **DNS** servers return the IP address of the Web server associated with that name.

## **UNIT-1 – Overview and Physical Layer**

### **5 Marks**

1. Discuss about TCP/IP protocol structures.
2. Draw the layer of OSI reference model.
3. Define frequency division multiplexing
4. Discuss about time division multiplexing
5. What is code division multiplexing?
6. Discuss about twisted pair.
7. Define co-axial cable
8. What are the header and trailer and how they get added and removed?
9. Give benefit note on switching.
10. Explain protocol hierarchies with neat diagram
11. Discuss NSF net and internet.

### **10 Marks**

1. What is mean by transmission media? Explain guided media.
2. Draw the block diagram of OSI reference model.
3. What is switching? Explain circuit switching networks.
4. Briefly discuss about packet switching networks.
5. Explain the different kinds of networks.
6. What is multiplexing? Explain FDM.

## **UNIT-2 – DataLink Layer**

### **5 Marks**

1. Show the type of errors in data link layer with neat diagram.
2. Explain the CRC with example
3. Explain geosynchronous satellite with diagram
4. Detail discussion about the public switched telephone network. Explain.
5. Discuss about MEO satellite with diagram.
6. Discuss about LEO satellite with diagram.
7. Discuss about various connecting devices.

### **10 Marks**

1. Explain the requirement for error control mechanism
2. Discuss the following (i).Wireless transmission. (II) Communication satellite.

3. Explain briefly the architecture of Bluetooth.
4. What is ALOGA? Explain Pure ALOGA.
5. Discuss about CSMA and its types.

### **UNIT-3 – Network Layer**

#### **5 Marks**

1. List down the functionality of network layers
2. Write short notes on network address.
3. Explain simplex stop and wait protocol.
4. Explain error deduction code with example.
5. What are the internet organizations of network layer?
6. Explain any one of the elementary data link protocol in detail.
7. Briefly explain the sliding window protocol detail.

#### **10 Marks**

1. Give a detailed account on Ipv6.
2. Explain congestion control algorithm.
3. Explain any two error deduction and correction technique briefly.
4. Explain in detail about routing algorithms.
5. Explain the structure of IPV4 Structure.

### **UNIT-4 – Transport Layer**

#### **5 Marks**

1. List down the features of UDP.
2. Show the function of transport layer.
3. Discuss about the future of TCP.
4. Explain about transport layer design issues.
5. What is TCP timer? Explain.

#### **10 Marks**

1. Describe error control and flow control.
2. Explain congestion control algorithm.

### **UNIT-5 – Application Layer**

#### **5 Marks**

1. Discuss message format in E-Mail system.
2. Explain domain naming system.
3. Write a short note on DNS?
4. Discuss about architecture of WWW.
5. Explain HTTPS.

#### **10 Marks**

1. Explain types of Domain Naming System.
2. Explain the architecture of WWW.



