

# PNS SCHOOL OF ENGINEERING & TECHNOLOGY

## Internal Assessment:2023

Subject: DCCN (Th-2) 4<sup>th</sup> Sem

Branch: Computer Science & Engineering

Time:1 Hour

F.M.20

### 1. Answer the following Questions. (Any five).

- a) Write down at least 3 Network Criteria.
- b) Write down 4 categories of network and its abbreviations.
- c) Write down the Functionality of transport layer and what is segmentation?
- d) Explain what is bandwidth and its properties.
- e) Differentiate between digital signal and analog signal.
- f) Explain what is noise and its types.

### 2. Answer the following questions (Any Two)

- a) Explain difference between guided media, unguided media and its classifications.
- b) Write down what is TCP/IP model and functions of its layers.
- c) Write down what is topology and explain with examples.

### Answers

#### 1.a) Write down at least 3 Network Criteria.

Most important of these criteria are the 3 criteria as follows.

1. **Performance:** - Performance is a measurement of various factors such as the amount of time requires for messages to travel from one device to another, the time it requires to get a response starting from an inquiry
2. **Reliability:** - Network reliability is measured by the frequency of failure, time it takes to recover from failure, the network's robustness.
3. **Security:** - Network must be secured. The data that is sent should reach its destination safely without any third-party reading or altering or destroying the data in the midway.

b) Write down 4 categories of network and its abbreviations.

- PAN (Personal Area Network)
- LAN (Local Area Network)
- MAN (Metropolitan Area Network)
- WAN (Wide Area Network)

C) Write down the Functionality of transport layer and what is segmentation?

**Transport Layer:** - The basic function of the Transport layer is to accept data from the session layer, split it up into smaller units, if need be, pass these to the Network layer, and ensure that all the pieces arrive correctly at the other end.

**Segmentation:** - Network segmentation is an architectural approach that divides a network into multiple segments or subnets, each acting as its own small network.

d) Explain what is bandwidth and its properties.

Bandwidth refers to the data transfer capacity of a computer network, denoted by bits per second (bps). It may also be colloquially applied to show a person's capacity for tasks or deep thoughts at a single point of time.

**Properties:** -Bandwidth is important for determining how fast a web page loads on your browser. For that reason, it's one of the most important things to consider when choosing a platform for your website.

e) Differentiate between digital signal and analog signal.

Analog Signals	Digital Signals
Analog signal is continuous and time varying.	Digital signal has two or more states and in binary form.
Troubleshooting of analog signals are difficult.	Troubleshooting of digital signals are easy.
An analog signal is usually in the form of sine wave.	A digital signal is usually in the form of square wave.

Easily affected by the noise.

These are stable and less prone to noise.

**f) Explain what is noise and its types.**

Noise refers to anything that interferes with the communication process between a speaker and an audience. It's also called interference.

The four most important to the telecommunication/data communication technologist are **thermal noise, intermodulation noise, crosstalk and impulse noise.**

**2.a) Explain difference between guided media, unguided media and its classifications.**

	<b>Guided Media</b>	<b>Unguided Media</b>
1.	The guided media is also called wired communication or bounded transmission media.	The unguided media is also called wireless communication or unbounded transmission media.
2.	The signal energy propagates through wires in guided media.	The signal energy propagates through the air in unguided media.
3.	Guided media is used for point-to-point communication.	Unguided media is generally suited for radio broadcasting in all directions.
4.	It is cost-effective.	It is expensive.
5.	Discrete network topologies are formed by the guided media.	Continuous network topologies are formed by the unguided media.
6.	Signals are in the form of voltage, current, or photons in the guided media.	Signals are in the form of electromagnetic waves in unguided media.

**b) Write down what is TCP/IP model and functions of its layers.**

**TCP/IP Model** helps you to determine how a specific computer should be connected to the internet and how data should be transmitted between them. It helps you to create a virtual network when multiple computer networks are connected together.

TCP/IP stands for Transmission Control Protocol/ Internet Protocol.

TCP/IP is a layered server architecture system in which each layer is defined according to a specific function to perform. All these four TCP IP layers work collaboratively to transmit the data from one layer to another.

- Application Layer
- Transport Layer
- Internet Layer
- Network Interface

**Application Layer:** - Application layer interacts with an application program, which is the highest level of OSI model. The application layer is the OSI layer, which is closest to the end-user. It means the OSI application layer allows users to interact with other software application.

**Transport Layer:** - Transport layer builds on the network layer in order to provide data transport from a process on a source system machine to a process on a destination system. It is hosted using single or multiple networks, and also maintains the quality-of-service functions.

**Internet Layer:** - An internet layer is a second layer of TCP/IP layers of the TCP/IP model. It is also known as a network layer. The main work of this layer is to send the packets from any network, and any computer still they reach the destination irrespective of the route they take.

**Network interface Layer:** - Network Interface Layer is this layer of the four-layer TCP/IP model. This layer is also called a network access layer. It helps you to defines details of how data should be sent using the network.

**c) Write down what is topology and explain with examples.**

The arrangement of a network that comprises nodes and connecting lines via sender and receiver is referred to as network topology. The various network topologies are:

**Mesh Topology:**

In a mesh topology, every device is connected to another device via a particular channel. In Mesh Topology, the protocols used are AHCP (Ad Hoc Configuration Protocols), DHCP (Dynamic Host Configuration Protocol), etc.

**Star Topology:**

In star topology, all the devices are connected to a single hub through a cable. This hub is the central node and all other nodes are connected to the central node. The hub can be passive in nature i.e., not an intelligent hub such as broadcasting devices, at the same time the hub can be intelligent known as an active hub.

**Bus Topology:**

Bus topology is a network type in which every computer and network device is connected to a single cable. It is bi-directional. It is a multi-point connection and a non-robust topology because if the backbone fails the topology crashes.

**Ring Topology:**

In this topology, it forms a ring connecting devices with exactly two neighbouring devices.

A number of repeaters are used for Ring topology with a large number of nodes, because if someone wants to send some data to the last node in the ring topology with 100 nodes, then the data will have to pass through 99 nodes to reach the 100th node. Hence to prevent data loss repeaters are used in the network.

**Tree Topology:**

This topology is the variation of the Star topology. This topology has a hierarchical flow of data. In Tree Topology, protocols like DHCP and SAC (Standard Automatic Configuration) are used.