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**BSCS**

**6th Semester**

**Computer Networks – Lab 2**

**Task 1:**

Write down the advantages and disadvantages of RJ45 connectors?

**Answer:**

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| --- | --- |
| **Advantages** | **Disadvantages** |
| ***Reliability:*** RJ45 provide stable connection ensuring consistence data transfer without any interference. | ***Limited Distance:*** While RJ45 connectors can be used for various distances, their performance can degrade over long distances, especially when transmitting high-bandwidth data. |
| ***Bandwidth:*** RJ45 connectors can support up to 100Mbps. | ***Limited Bandwidth:*** While RJ45 connectors can support high bandwidths, newer technologies like fiber optic cables can offer significantly higher bandwidth capabilities for demanding applications. |
| ***Cost-effective:*** These connectors are less costly than fiber optics | ***Susceptibility to Damage:*** The exposed pins of RJ45 connectors can be susceptible to damage if mishandled or exposed to harsh environments. |
| ***Simplicity:*** RJ45 are simple and easy to connect. |  |
| ***Shielding:*** RJ45 connectors often incorporate shielding to protect against electromagnetic interference (EMI), which is crucial for maintaining data integrity in noisy environments. |  |

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**Task 2:**

Briefly explain how the data is transmitted in wireless medium?

**Answer:**

In wireless communication, data is transmitted through electromagnetic waves (mostly radio waves), which travel through the air. These waves are generated by an antenna at the transmitting end, carrying the encoded data. The waves propagate through the air and are received by an antenna at the receiving end. When an antenna is attached to electrical circuit of a computer or wireless device, it converts the digital data into wireless signals (encoding) and spread all over within its frequency range. The receptor on the other end receives these signals and converts them back to digital data (decoding).

**Task 3:**

Briefly explain all type of network topologies.

**Answer:**

A network topology refers to the physical arrangement of devices (computers, servers, etc.) in a network. There are several common topologies:

**1. Bus Topology**

* **Structure:** Devices are connected in a linear fashion, like a bus.
* **Advantages:** Simple to implement, cost-effective, and easy to troubleshoot.
* **Disadvantages:** If a cable breaks, the entire network is affected. Centralized failure point.

**2. Ring Topology**

* **Structure:** Devices are connected in a circular fashion, forming a ring.
* **Advantages:** Reliable, failure in one device doesn't affect the entire network.
* **Disadvantages:** Difficult to add or remove devices, and troubleshooting can be complex.

**3. Star Topology**

* **Structure:** All devices are connected to a central hub or switch.
* **Advantages:** Easy to manage, scalable, and fault isolation is simple.
* **Disadvantages:** If the central hub or switch fails, the entire network is down.

**4. Mesh Topology**

* **Structure:** Every device is connected to every other device.
* **Advantages:** Highly reliable, redundant paths, and can handle heavy traffic.
* **Disadvantages:** Complex to implement, expensive, and requires many cables.

**5. Tree Topology**

* **Structure:** A hierarchical structure, similar to a tree, with a root node at the top and branches extending downwards.
* **Advantages:** Scalable, easy to manage, and provides a clear hierarchy.
* **Disadvantages:** Can be complex to implement, and a failure at the root node can affect the entire network.