COMPUTER NETWORKS KCS-653

PRACTICAL-01

Practical - 1

Aim: Implementation of BUS, STAR, MESH and HYBRID topology in CISCO packet Tracer using switches and devices.

Software Used: CISCO Packet Tracer.

Theory: CISCO Packet Tracer

Packet Tracer is a tool that allows you to simulate real networks. It provide three main menus that you can use for the following:

• Add devices and connect them via cables or wireless.

• Select, delete, inspect, label, and group components within your network.

• Manage your network.

Topology: A network topology is the physical and logical arrangement of nodes and connections in a network. Nodes usually include devices such as switches, routers and Software with switch and router features.

• **Bus Network:** In the bus network topology, every node is connected in series along a single cable. This arrangement is found today primarily in cable broadband distribution networks.

Packet Tracer Steps:

1. Drag and drop the required number of PCs and a switch onto the workspace.

2. Connect all devices to a single cable segment by clicking and dragging the connector between them.

3. Configure IP addresses and subnets for each PC manually.

4. Verify connectivity using ping between PCs (some require enabling promiscuous mode in settings).
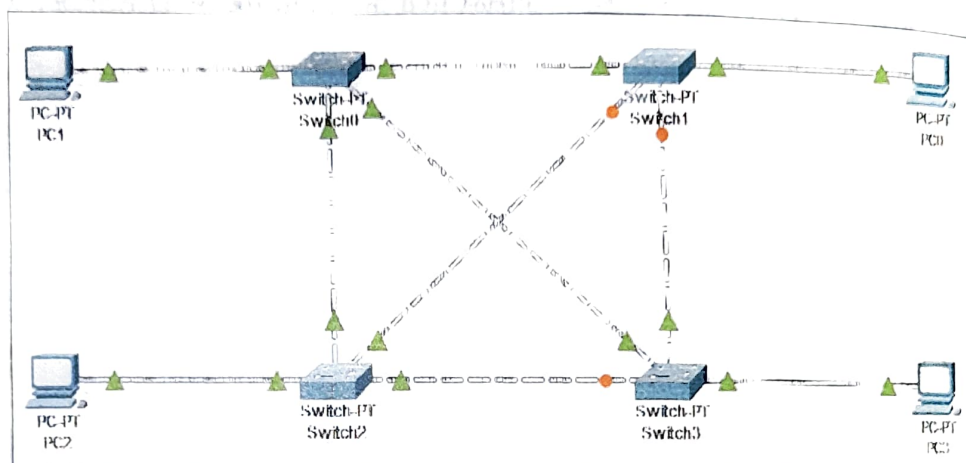
• **Star Network:** In the star network topology, a central device connects to all other nodes through a central hub. Switched local area networks based on Ethernet switches and most wired home and office networks have a physical star topology.
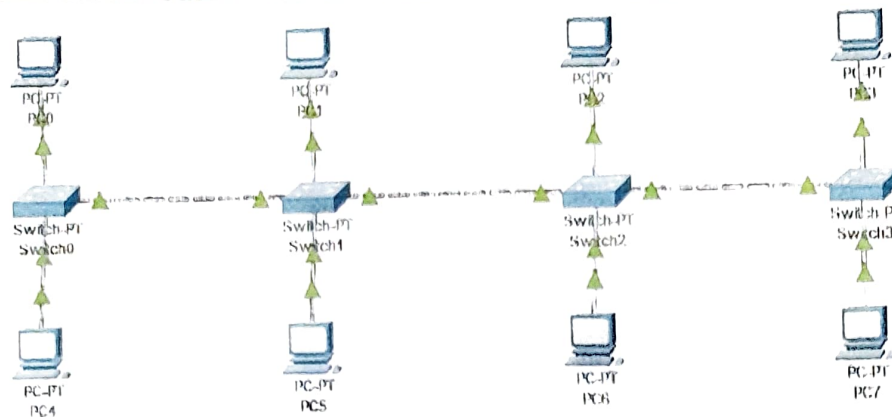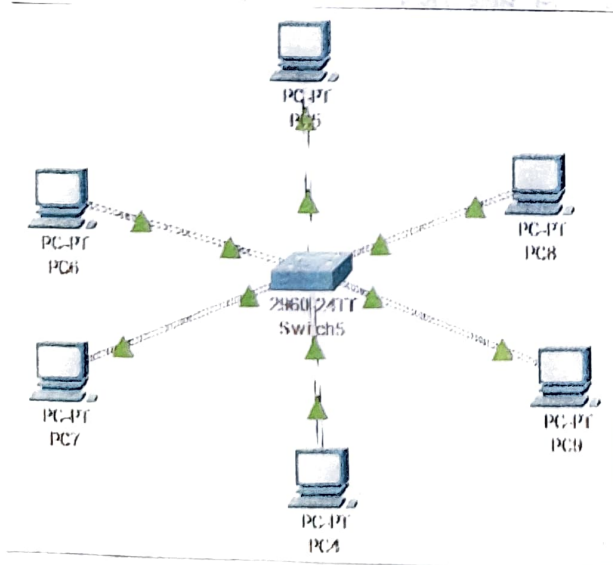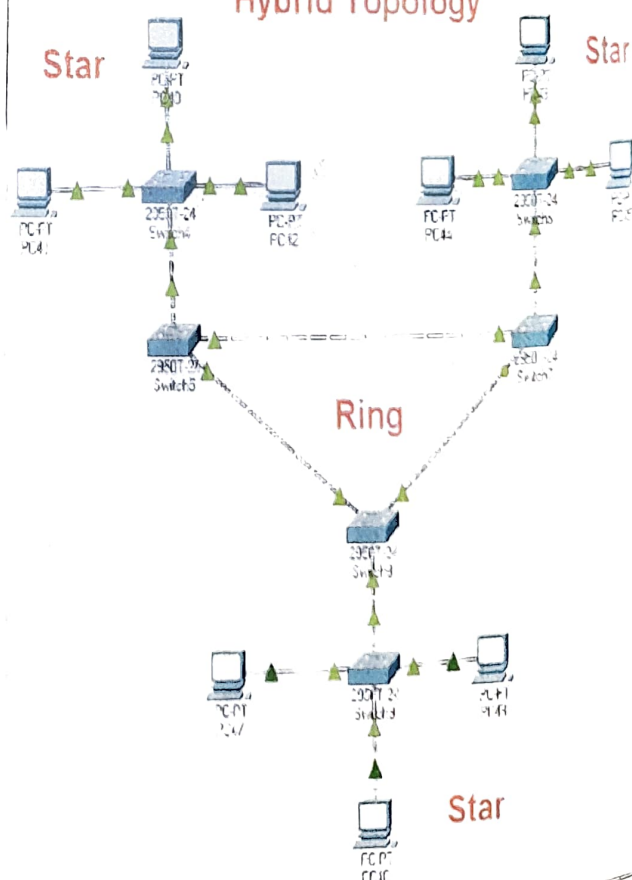
→ Bus Topology

Mesh Topology ←

Hybrid Topology

Star

Star

Star Topology

Ring

Star

Packet Tracer Steps:

1. Place PCs and a switch on the workspace.

2. Connect each PC to an individual port on the switch using straight-through cables.

3. Assign IP addresses and subnets to each PC.

4. Test connectivity between PCs using ping

• Mesh Network: The mesh network topology links nodes with connections so that multiple paths between at least some points of the network are available. A network is considered to be fully meshed if all nodes are directly connected to all other nodes and partially meshed if only some roots have multiple connection to others. However more space is needed for dedicated links.

Packet Tracer Steps:

1. Add PCs and switches to the workspace.

2. Connect each PC to multiple other devices & switches, forming a mesh like strouchore.

3. Configure IP addresses and subnets for all devices.

4. Verify connectivity with ping between different PCs, considering multiple paths might be involved.

• Hybrid Network: It is any combination of two or more topologies. Hybrid topologies typically provide typically exceptional flexibility, as they can accomodate a number of setups. For example, different departments in the same organisation may opt for personalised network topologies that are more adaptable to their network needs.

Packet tracer Steps! ① Design your desired hybrid topology
② Add necessary devices & connect them.
③ Configure IP addresses & subnets for each device.
④ Test your connectivity.

Result: Successfully constructed all topologies.

Teacher's Signature : _____