Activity Sheet:

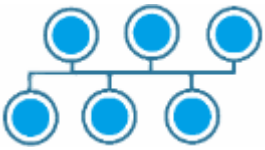
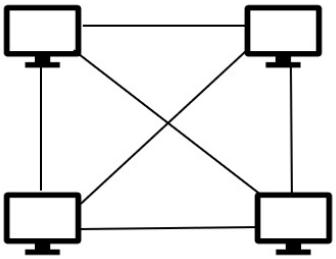
A. Slow Learners

Activity 1: Topology Drawing Exercise

Problem: Draw and label the following network topologies. For each, mention one real-world scenario where it might be used.

Topology	Diagram	Example Use Case
Bus		
Star		
Mesh		

Solution:

Topology	Diagram	Example Use Case
Bus		Old Ethernet networks
Star		Home/office Wi-Fi with router
Mesh		Wireless mesh networks in smart cities

Activity 2: Identify Basic Issues from Logs

Problem: Analyze the following command outputs. Identify the likely basic issue in each case.

Command Output	Basic Issue Identified
ping 192.168.1.1 → Request Timed Out	
ipconfig → IP Address: 169.254.x.x	
Ping www.google.com → DNS name could not be resolved	

Solution:

1. **Ping timeout → No network connectivity**
2. **169.254.x.x IP → DHCP server not reachable**
3. **DNS error → Name resolution failure**

B. Moderate Learners

Activity 1: Interpret Command Outputs

Problem: Study the following command outputs and explain what each reveals.

Command Output	Command Action	Output Specification
ping 8.8.8.8 → Reply from 8.8.8.8: time=23ms		
ipconfig → IP Address: 192.168.1.10, Gateway: 192.168.1.1		
ping 192.168.1.1 → Request timed out		
nslookup www.google.com → Address: 142.250.183.68		
netstat -an → TCP 192.168.1.10:5000 ESTABLISHED with 172.16.0.2:80		

Solution:

Command Output	Command Action	Output Specification
ping 8.8.8.8 → Reply from 8.8.8.8: time=23ms	**Checking if the internet (Google DNS) is reachable**	**The Internet is working, with 23ms latency**
ipconfig → IP Address: 192.168.1.10, Gateway: 192.168.1.1	**Shows local IP configuration**	**The PC has a valid IP and default gateway.**
ping 192.168.1.1 → Request timed out	**Checking the connection to the local router**	**The router is unreachable – maybe offline or disconnected**
nslookup www.google.com → Address: 142.250.183.68	**Resolving a domain name to an IP address**	**DNS resolution is working correctly**
netstat -an → TCP 192.168.1.10:5000 ESTABLISHED with 172.16.0.2:80	**Lists current TCP/UDP connections**	**A TCP connection to a web server (port 80) is active**

Activity 2: Tool-Function Match Table

Problem: Match each tool with its primary function.

Tool	Function Letter
I. ping	A. Displays all active TCP/UDP connections
II. traceroute	B. Checks connectivity with a host
III. ipconfig	C. Shows current IP configuration
IV. nslookup	D. Resolves domain names to IP addresses
V. netstat	E. Traces the route to a remote host

Solution:

I → B, II → E, III → C, IV → D, V → A

C. Fast Learners

Activity 1: Mini Project Planning Worksheet

Problem: Choose one project idea from the below table options below and fill in the following table.

Project Title	Brief Description	Core Technologies	Expected Skills
Chat App	An application enabling live text communication between two or more networked users.	- Peer-to-peer or client-server communication - Socket programming - TCP/UDP protocol usage	- Handling synchronous messaging - Implementing sockets - Real-time interaction
File Transfer App	A software that facilitates sending and receiving files across connected systems.	- Reliable data transfer over TCP - Breaking and rejoining file chunks - Progress/error management	- File transmission logic - Managing large data flow - Ensuring data integrity
Network Monitor	A tool that observes and reports on device status, data usage, and live connections.	- Packet capture and traffic analysis - Command-line tools (e.g., netstat, system monitors) - Graphical reporting (optional)	- Monitoring network behavior - Visualizing traffic - Security inspection

- ➔ Project Title (Choose one: Chat App, File Transfer App, Network Monitor)
- ➔ Objective (What does your app do?)
- ➔ Tools/Technologies Required (e.g., Python, Sockets, Wireshark)
- ➔ Architecture Diagram (Text Form)
- ➔ Challenges You Expect to Face
- ➔ How Will You Test Your Project?