**1. Activities Based on Learner Type**

**A. Slow Learners**

**Activity 1: IP Address Identification**

From the given list of IP addresses, classify each address as:

* + - Class A, B, or C
    - Private or Public
    - Valid or Invalid based on the format

Use the table below to fill in your answers.

**Example IP Address Table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **IP Address** | **Class** | **Private/Public** | **Valid/Invalid** |
| 192.168.1.10 |  |  |  |
| 10.300.5.25 |  |  |  |
| 172.16.0.1 |  |  |  |
| 256.1.1.1 |  |  |  |

**Solution:**

|  |  |  |  |
| --- | --- | --- | --- |
| IP Address | Class | Private/Public | Valid/Invalid |
| 192.168.1.10 | C | Private | Valid |
| 10.300.5.25 | A | Private | Invalid |
| 172.16.0.1 | B | Private | Valid |
| 256.1.1.1 | - | - | Invalid |

**Activity 2: Routing Type Comparison Table**

* **Instructions:** Complete the table below comparing Static and Dynamic Routing.

|  |  |  |
| --- | --- | --- |
| Parameter | Static Routing | Dynamic Routing |
| Setup Effort | Manual setup | Automatically configured |
| Adaptability | Low | High (adapts to changes) |
| Use Cases | Small networks, stable paths | Large/complex, changing routes |

**B. Moderate Learners**

**Activity 1: Subnetting Exercises**

**Instructions:** Solve the following subnetting problems.

**Given:** IP - 192.168.10.0/24

**Requirement:** Create 4 subnets

**Answer:**

Subnet Mask: 255.255.255.192 (/26)

Subnets:

192.168.10.0 – 192.168.10.63

192.168.10.64 – 192.168.10.127

192.168.10.128 – 192.168.10.191

192.168.10.192 – 192.168.10.255

**Activity 2: Cisco Packet Tracer – Basic Connectivity**

**Instructions:**

* 1. Create a simple network with 2 PCs, 1 switch, and 1 router.
  2. Assign IP addresses (e.g., 192.168.1.1 for PC1, 192.168.1.2 for PC2, 192.168.1.254 for Router).
  3. Configure interfaces: Router (Gig0/0): 192.168.1.254/24

PC1: 192.168.1.1/24, Gateway: 192.168.1.254

PC2: 192.168.1.2/24, Gateway: 192.168.1.254

* 1. Connect all devices using appropriate cables (straight-through between the switch and devices, and crossover between the switch and router).
  2. Test connectivity with the ping command from each PC to the router and the other PC.

**Expected Outcome (Solution):**

* All devices can ping each other successfully.
* Indicates that IP addressing and gateway settings are correctly configured.

**C. Fast Learners**

**Activity 1: Packet Routing Simulation using Graph/Tree Structures**

* **Instructions:**
  1. Represent a small network as a graph.
  2. Simulate routing decisions (shortest path, updates).

**Example:**

* Nodes: Routers (R1, R2, R3)
* Edges: Links with weights (costs)
* Use Dijkstra’s algorithm to find the shortest paths from R1

**Activity 2: Technical Summary / Presentation** Prepare a brief (2–3 page) written report or 5-slide presentation covering:

1. **Role of ICMP in Network Diagnostics**

Tools: ping, traceroute

Function: Echo requests/replies, time exceeded

1. **Use of ARP in LAN Communication**

Resolves IP to MAC

Works within the broadcast domain

1. **Difference between RIP and OSPF**

RIP: Distance vector, uses hop count, slower convergence

OSPF: Link-state, builds complete topology, faster convergence, more scalable