Q8)You configured VLANs 10 and 20 on your switch and assigned ports to each VLAN. However, devices in VLAN 10 cannot communicate with devices in VLAN 20. Troubleshoot the issue.

Troubleshooting Inter-VLAN Communication Issue

If devices in **VLAN 10** cannot communicate with devices in **VLAN 20**, the issue is likely due to a lack of **Inter-VLAN routing**, misconfigurations in VLAN assignments, or trunking issues. Follow these steps to troubleshoot:

1. Verify VLAN Configuration

Check if VLANs 10 and 20 are created and ports are assigned correctly.

2. Verify Port Modes

Ensure that access ports are correctly configured for their VLANs.

```
Switch(config)# interface FastEthernet 0/1
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 10
Switch(config-if)# exit

Switch(config)# interface FastEthernet 0/2
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 20
```

- If the ports are in the **wrong VLAN**, reassign them.

3. Enable Inter-VLAN Routing

L2 switches do not route between VLANs. A Layer 3 device (Router-on-a-Stick or L3 Switch) is required.

- **For Router-on-a-Stick (Router with Subinterfaces):**

  ```
  Router(config)# interface GigabitEthernet 0/0.10
  Router(config-subif)# encapsulation dot1Q 10
  Router(config-subif)# ip address 192.168.10.1 255.255.255.0
  Router(config-subif)# exit

  Router(config)# interface GigabitEthernet 0/0.20
  Router(config-subif)# encapsulation dot1Q 20
  Router(config-subif)# ip address 192.168.20.1 255.255.255.0
  Router(config-subif)# exit
  ```

- Ensure trunking is enabled between the switch and router.

- **For Layer 3 Switch (SVI Configuration):**

  ```
  Switch(config)# interface Vlan10
  ```

```
Switch(config-if)# ip address 192.168.10.1 255.255.255.0
Switch(config-if)# no shutdown

Switch(config)# interface Vlan20
Switch(config-if)# ip address 192.168.20.1 255.255.255.0
Switch(config-if)# no shutdown
```

4. Verify Trunking Configuration

Ensure the uplink between the switch and router or L3 switch is configured as a **trunk**.

```
Switch(config)# interface GigabitEthernet 0/1
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk allowed vlan 10,20
```

- If the trunk is missing VLANs, allow them using switchport trunk allowed vlan command.

5. Check Default Gateway on End Devices

Each device in VLAN 10 and VLAN 20 should have the correct **default gateway**, which is the router or L3 switch's IP address in that VLAN.

- **PC in VLAN 10:** 192.168.10.1
- **PC in VLAN 20:** 192.168.20.1

6. Test Connectivity

Ping from one VLAN to another:

```
PC1> ping 192.168.20.100
```

If **ping fails**, check **firewall settings**, ACLs, or missing routes on the router.

By following these steps, inter-VLAN communication should be restored.