	CSE-331L: Computer Networks	Instructor: Anam Iftikhar	
	Lab Project		
	Roll No: 2020-CS-639, 2020-CS-627	**Total Marks: 30** **Marks Obtained:**	**CLO4**

❖ **In Report:**

- Network topology (Properly labelled Packet Tracer Network Diagram)
- Sub Nets / VLANs / VLSM details
- Configuration Details
- Test Cases Simulations

The term unit is to represent the no of departments in the organization or institute selected

1. You are designing a network for:

University Network Scenario

**Example: School, College, University, Hospital, Any Organization*

2. No of Separate Units in *above mentioned:*

No of Separate Units= 7

**Should not be less than five*

**Each Unit should have a separate network*

3. Define the cost or budget of the *above mentioned* in terms of networking devices*:*
   - **No. of Routers: 4 routers (price per router 150) =600 overall cost in topology**
   - **No. of Switches: 9 switches (price per switch 1500) =13500 overall cost on all units**
4. Define the number of End Devices allowed in each Unit:
   - No. of Personal Computers **minimum 1 and maximum 5**
   - Printers **minimum 1 and maximum 3**
   - Cellular Devices
   - *Any other* ***Http FTP DNS Email laptop DHCP***
5. Define the number of Border Router:

   The border or gateway router is the network device that connects interior and exterior routers. (number of Border Router = **1)**

**should be at least one*

6. Define the number of Routers connected to ISP for internet:

Broader router is connected to ISP router for internet services.

The number of Routers connected to ISP for internet=1

**should be at least one*

*[You can use border router to connect to ISP]

7. Communication amongst the Units:
    - **ALL UNITS WILL ABLE TO COMMUNICATE WITH EACH OTHER.**
    - **But Unit 1 cannot communicate with Unit 5 (communication restricted by Access-control list)**

**At least two units will not be able to communicate with each other*

8. Define the number of servers and Types:

    Total number of Servers =6

    Types= 1 DNS server, 1 FTP HTTP server, 1 HTTP server, 1 Email server, 2 DHCP server

    Unit 2 : 1 DNS server, 1 FTP HTTP server, 1 HTTP server, 1 Email server

    Unit 3 and Unit 6 has DHCP sever

    **Example: HTTP Server (Google, Yahoo) or FTP or Email Server*

    **One unit must have two servers' web and email*

9. Un-authorized Access:
    - **Server Room has 4 servers**
    - **Unit 1 and Unit 4 can access all servers**
    - **Unit 3 can't access 1.0.0.3 HTTP server (Access-list used to control (deny) the access of Http server for unit 3)**
    - **Unit 5 can't access 1.0.0.4 FTP, HTTP server (Access-list used to control (deny) the access of Http server for unit 5)**
    - **Unit 6 can't access 1.0.0.4 FTP, HTTP server (Access-list used to control (deny) the access of Http server for unit 6)**
    - **Unit 7 can't access 1.0.0.4 FTP, HTTP server (Access-list used to control (deny) the access of Http server for unit 7)**

**One unit can have access to all the servers*

**Restrict remaining units to access one or two servers*

10. Routing Protocols used:
    a) Between internal routers:
       10.10.0/ RIP routing protocol
       30.30.0/ RIP routing protocol
    b) With ISP router:
       ***20.20.0/ RIP* routing protocol**

**RIP, RIPv2, Static Routing, OSPF, BGP or any other*

11. Private IP used (*select one prefix*):

- ☐ 10/8
- ☐ 172.16/12
- ☐ **192.168/16 (Selected for private IP)**

**Use DHCP to assign IP addresses to two units for rest of the units use static addressing*

12. No. of Public Addresses allocated by ISP to *above mentioned*:

20.20.0.2 public IP provided by ISP
Unit No 3: 192.168.2.0 private 10.10.0.1 public (Nat translation private to public translation)
Unit No 6: 192.168.4.0 private 20.20.0.1 public (Nat translation private to public translation)

**Example: The ISP has allocated 10 public addresses for this university, 105.12.32.15 – 24/25. *Last two addresses must be reserved for the web server and email server.*

**All private addresses allocated must be translated to public when accessing the Internet.*