XYZ University is a large university with 7 branches located throughout a country. The university has over 50,000 students, faculty, and staff members who rely heavily on the university's network for research, communication, and learning. The university's IT department is responsible for designing and maintaining the network infrastructure for all the campuses.

Requirements:

- The network should be able to support the large number of users and devices on each campus.
- The network should provide reliable and high-speed connectivity for all the campuses.
- The network should be secure and able to prevent unauthorized access and cyber-attacks.
- The network should be able to support the different applications and services used by the university.
- The network should be easy to manage and maintain.

Design:

The proposed network design for XYZ University includes the following components:

- Core Network: The core network is the backbone of the network infrastructure, and it provides the main connectivity between all the network devices. It will consist of high-performance switches and routers that will be located at the main campus.
- Distribution Network: The distribution network will provide connectivity to the different campuses. It will consist of switches and routers that will be located at each campus.
- Access Network: The access network will provide connectivity to end-user devices. It will consist of switches that will be located in each building on each campus.
- Wireless Network: The network will also have a wireless network to provide connectivity to mobile devices such as smartphones and tablets.
- Security: The network will have multiple layers of security to prevent unauthorized access and cyber-attacks.
- Management: The network will be managed using a centralized network management system that will allow the IT department to monitor and control the network devices from a single location.
- Backup and Redundancy: The network will have backup and redundancy measures in place to ensure that the network is always available and that data is not lost in the event of a network failure.

Tasks

1. Design a logical topology diagram for the above scenario.

2. Design a physical topology diagram for the above scenario.

3. Suggest appropriate devices for the design (Must be real devices). Justify your suggestions.

4. Suggest appropriate media types for the design. Justify your suggestions.

5. Suggest appropriate LAN technologies & WAN technologies for the design. Justify your suggestions.

6. Suggest the protocols for each layer according to ISO/OSI layered architecture. Provide justification for your suggestions.

7. Design an IP addressing schema to interconnect all the branches by using an appropriate private IP address range. (Note that you can only buy one Private IP address range and must use VLSM to derive all the network addresses by minimizing the wastage of IP addresses)

Deliverables:

Create a presentation (ppt) that includes answers for all the questions in the above task and upload it to the given link in CourseWeb.

Deadline: 28th May 2023

Presentations: 29th May 2023 – 11th June 2023

Marks allocation for the Assignment

Logical topology design	15
Physical topology design	15
Choosing appropriate devices with justifications	10
Choosing appropriate media types with justifications	10
LAN technologies	5
WAN technologies	5
Choosing appropriate protocols with justifications	10
Choosing the Private IP address range	5
Designing IP addressing schema (With VLSM)	15
Presentation skills	5
Q & A (Viva)	5
Total	**100**