***Submission date: May 22 2023***

**ABC Institute's Network Description**

ABC Institute is a higher education provider in Kathmandu. ABC is located in three-level office building for their employees work each day. There are no remote users. While they have a computer network and are connected to the Internet. All of their computers are desktop machines and are connected with wired Ethernet connections. All of the network wiring is CAT-6 twisted pair wiring that goes from the office location to a wiring cabinet. There is one wiring cabinet on each floor. Each cabinet is connected to the basement wiring cabinet via fiber.

There are several departments of the institute. The administrative office has 12 employees including the Campus Director, Associate Dean, a human resources manager, and several assistants and secretaries. The accounts office has 10 employees. Both of these divisions are on the third floor.

The second floor has the Marketing department. There are a total of 15 employees in the Marketing Department and includes Marketing executives and assistants. All of the marketing department personnel have laptop computers, but they are still connected via the wired network.

The first floor has the academic department, classes/training rooms and the receptionist. The receptionist shares a computer with the administrative office. There are 24 people in academic department, they use 24 computers to enter their academic records into the institute's current system. There is also a conference room/training room on the first floor with a multimedia system that includes a podium computer, projector and all of the bells and whistles. The basement houses the information technology and maintenance department and the mail room. The mail room clerk uses one computer. The two maintenance workers have computers at their desks that they use to enter reports of work performed. The IT Department has eight employees, each with a desktop computer.

ABC has planned to invest in their network Infrastructure and host their own web server and database server and also decided to have internet connection with different ISP and load balance their Internet traffic and if one ISP goes down other ISP should automatically take all the Internet traffic without any downtime.

Also ABC wants to implement a ICT Network Monitoring solution which provide in depth knowledge and logs and traffic flow of their network. ABC wants to manage its own server farm, which includes two domain controllers, one print server, one mail server, one database server, one internal web server, one external web server (having the firewall), a file server, a special server for the ERP system, and a backup server.

Now, your roles as Network Administrator to propose a network design suit for their needs.

1.Site Selection must be done with expansion consideration.

2.Hardware Devices Vendor selection and OS selection must be done with proper support and cost consideration

3.Forecast future growth and receission consideration

4.Place your network devices on your network diagram.(Packet Tracer tools is preferred)

5.Explain the cooling, Heating and lightening requirement and consideration.

Assessment Task:

You are required to design the physical design of the network while considering the logical design of the network. In order to develop your physical design, you may need to make reasonable assumptions. You also have to complete your final network design report.

Your report should include the following:

1. Executive Summary

2. Table of Contents

3. Project Goal

4. Project Scope

5. Design requirements

a. Business Goals and Constraints

b. Technical Goals and Tradeoffs

c. User Communities and Network Applications

d. List of Assumptions

6. Logical Network Design

a. The logical network diagrams including addressing and naming

b. The explanation and justification of your logical design

c. The list of routing and switching protocols, and security mechanisms

7. Physical Network Design

a. The final network diagram

b. The table of networking & communication devices and applications required, including the cost of each of them, the IP addresses, the product numbers as well as the approximate total cost

c. The explanation and justification for the selection of the devices and applications required.

d. Write a test plan that can be used to test the new network.

e. Write one detailed test script for your test plan.

8. Prepare the user, business and security requirements of the organisation in relation to network design.

9. Analyze the user, business and security requirements.

10. Compare and contrast the possible alternative logical and physical network designs.

11. Design a network by applying the top-down network design methodology.

12. Create the final documentation of the designed network.

13. Justify that the designed network satisfies the requirements.

**You should create the network design report in word document with a limit of 2000 words. The report must follow Harvard citation and referencing guidelines.**

**Marking Structure**

