FACULTY OF COMPUTING
DEPARTMENT OF CYBERSECURITY
SECOND SEMESTER CA ASSIGNMENT, 2023/2024 SESSION

COURSE CODE : CYB 202   **COURSE CREDIT UNITS :** 3

Project One

Objective
Design and implement a computer network for Bingham university, segmented based on different faculties. This includes planning the network topology, IP subnetting and configuration network devices.

Task
Identify all the faculties in Bingham University and their departments and present the information in the following format:

Table A

#	Faculty	Number of departments
1	Faculty of Computing	3
2	Faculty of abc	n
3		

You are provided a network 192.168.4.0, you are required create subnets for each faculty with departments as the nodes (hosts).
   a. State the number of bits you will borrow from the Host ID to create the required number of subnets.
   b. Show the bits combinations that are possible from the number of bits borrowed in (a) above.
   c. Using the information in (b) compute the range of values for each network (show your work)
   d. Using a table, present the network ID, Host ID Range, Number of Usable Host IDs and Broadcast IDs for each of the networks as generated from (c) (Label this as Table B)
   e. Based on the information in Table A, use packet tracer to design the physical network showing the network equipment for each segment of the network.
   f. Use data in Table B, generated in (e) to implement the logical network.

Project Two
Objective
Use Windows Operating Systems basic tools to enhance the defence PCs and data

Task
You have been provided a manual on Windows Operating System Basics, study the manual and do the following:

i. Navigate the windows OS encryption tool to encrypt your pen drive (flash drive). Show all steps of this process with screenshots. Clearly show the encryption key generated.

CAUTION: DO NOT PERFORM THIS PROCESS ON YOUR HARDRIVE

ii. Enable Windows Defender on your system to support continuous scan for malware (malicious software), viruses, and security threats and provide real-time protection for your system. Show all steps with screen shots.

Project Three

Objective
Configure and manage Active Directory Domain Services (AD DS) on Windows Server 2019. This includes installing AD DS, promoting the server to a domain controller, and creating organizational units (OUs) and user accounts.

Tasks
1. **Install the Active Directory Domain Services Role:**

    ▪ Open the Server Manager.
    ▪ Add the Active Directory Domain Services (AD DS) role to your server.
    ▪ Take a screenshot of the confirmation window showing the role has been installed successfully.

2. **Promote the Server to a Domain Controller:**

    ▪ Use the AD DS Configuration Wizard to promote your server to a domain controller.
    ▪ Create a new forest named lab.local.
    ▪ Take a screenshot of the window confirming the successful promotion to a domain controller.

3. **Create Organizational Units (OUs):**
    o In the Active Directory Users and Computers (ADUC) console, create the following OUs under the lab.local domain:
        ▪ Students
        ▪ Faculty

- IT Staff
  - Take a screenshot of the ADUC console showing the newly created OUs.
4. **Create User Accounts:**

   - Create user accounts for three students (Student1, Student2, Student3), two faculty members (Faculty1, Faculty2), and two IT staff members (IT1, IT2) within their respective OUs.
   - Ensure that each user has a strong password and is required to change the password at the next logon.
   - Take a screenshot of the ADUC console showing the user accounts within their respective OUs.

5. **Verify AD DS Functionality:**

   - Use the Active Directory Administrative Center (ADAC) to verify that the OUs and user accounts are correctly configured.
   - Test logging in with one of the student accounts (Student1) on a separate client machine connected to the domain.
   - Take a screenshot of the client machine showing a successful login with Student1.

Note: Report this within your manual, where the space in the manual is not enough, print and attach additional sheets to the manual and submit.

Submission Requirements
Provide detailed reports documenting each step taken during the labs.
Include all required screenshots as evidence of successful completion.

Submission deadline 23rd August, 2024. However, those who completed their work before this deadline can submit.