

**Open Vocational Education Program**

# **CYBER SECURITY ASSISTANT**

## **PRACTICAL MANUAL**



**NATIONAL INSTITUTE OF OPEN SCHOOLING**

(An autonomous organisation under MoE, Govt. of India)

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## Practical 1

# INSTALL A WINDOWS 10 OPERATING SYSTEM ON A COMPUTER SYSTEM

### OBJECTIVES

After completing this practical, you will be able to:

- install the Windows operating system on a computer;
- configure BIOS/UEFI settings for boot priority;
- format a hard disk and partition it during installation;
- complete the setup of Windows, including creating a user account.

### SOFTWARE REQUIREMENT

1. Rufus, Unetbootin, Ventoy, Universal USB Installer (UUI) are the open source tools to make USB bootable.

### PROCEDURE/ACTIVITIES

1. Obtain a bootable USB or DVD containing the Windows operating system and ensure it is compatible with the target computer.
2. Restart the computer and press the appropriate key (e.g., F2, F12, and DEL) to access the BIOS/UEFI settings.
3. Configure the boot priority in BIOS/UEFI to select the USB or DVD drive as the primary boot device.
4. Insert the bootable USB or DVD into the computer and restart the system to boot from the installation media.
5. On the setup screen, select the desired language, time, and keyboard preferences, then click “Next” and “Install Now.”



Notes

6. Choose the “Custom: Install Windows only (advanced)” option for a clean installation.
7. Select the drive where you want to install Windows, format or create partitions as required, and click “Next” to initiate the installation.
8. Wait for the installation process to complete, as the system copies files, installs features, and configures settings, restarting multiple times during this phase.
9. After installation, configure initial setup preferences, including region, keyboard layout, and network settings, and create a user account with an optional password.
10. Install necessary drivers for hardware components and check for and apply any available Windows updates to complete the setup.

#### LEARNER’S OBSERVATIONS

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## Practical 2

# BASIC USAGE OF THE COMMAND LINE (WINDOWS)

### OBJECTIVES

After completing this practical, you will be able to:

- open and use the Command Prompt in Windows;
- execute basic navigation and file system commands;
- perform administrative tasks using the command line with proper syntax.

### PROCEDURE/ACTIVITY

#### 1. Opening the Command Prompt:

- Press Win + R, type cmd, and press Enter.
- The Command Prompt window will open.

#### 2. Executing Basic Commands:

##### 1. Navigation Commands:

###### (a) dir

- **Syntax:** dir [<path>]
- Displays a list of files and directories in the current folder or a specified path.

Example:

cmd

dir C:\Users



- (b) `cd`
  - 
  - **Syntax:**`cd [<path>]`
  - Changes the current directory to the specified directory.

Example:

```
cmd
```

- 

- (c) `cd Documents`

```
cd ..
```

- (d) `cls`

- (a) **Syntax:**`cls`

- (b) Clears the Command Prompt screen.

## 2. File and Directory Management Commands:

- (a) `mkdir`

- **Syntax:**`mkdir<folder-name>`
- Creates a new folder in the current directory.

Example:

```
cmd
```

```
mkdirMyFolder
```

- (b) `rmdir`

- 

- **Syntax:**`rmdir<folder-name>`
- Deletes an empty folder in the current directory.

Example:

```
cmd
```

```
rmdirMyFolder
```

- (c) `del`

- 

- **Syntax:**`del <file-name>`
- Deletes a specified file.



Example:

cmd

del report.txt

○

### 3. Checking System Information:

#### (a) echo %USERNAME%

○ **Syntax:**echo %USERNAME%

○ Displays the current logged-in user's username.

Example:

cmd

echo %USERNAME%

○

#### (b) hostname

○ **Syntax:**hostname

○ Displays the computer's hostname.

#### (c) systeminfo

○ **Syntax:**systeminfo

○ Displays detailed system information, such as OS version, memory, and network details.

### 4. Performing Administrative Tasks:

#### ● **Run as Administrator:**

○ Type cmd in the Start menu, right-click, and select **Run as administrator**.

#### ● **Creating a User Account:**

○ **Syntax:**net user <username><password> /add

Example:

cmd

net user JohnDoe password123 /add

○

#### ● **Deleting a User Account:**

○ **Syntax:**net user <username> /delete



Notes

Example:

```
cmd
```

```
net user JohnDoe /delete
```

5. Closing the Command Prompt:

- **Syntax:**exit

Example:

```
cmd
```

Copy code

```
exit
```

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## Practical 3

# BASIC USAGE OF THE COMMAND LINE (LINUX)

### OBJECTIVES

After completing this practical, you will be able to:

- Open and use the Linux terminal;
- Execute basic navigation and file system commands;
- Manage permissions and perform administrative tasks using sudo.

### PROCEDURE/ACTIVITY

#### 1. Opening the Terminal:

- Press Ctrl + Alt + T to open the terminal in Linux.

#### 2. Executing Basic Commands:

##### Navigation Commands:

- pwd
  - **Syntax:**pwd
  - Prints the current working directory.

Example:

```
bash
```

```
pwd
```

- 
- ls
  - **Syntax:**ls [options] [path]
  - Lists files and directories in the current or specified directory.



Example:

```
bash
```

```
ls
```

```
ls -l /home
```

- 

- cd

- **Syntax:**cd [directory]

- Changes the current working directory.

Example:

```
bash
```

```
cd Documents
```

```
cd ..
```

- 

### 3. Creating and Managing Files/Directories:

- mkdir

- **Syntax:**mkdir<directory-name>

- Creates a new directory.

Example:

```
bash
```

```
mkdirMyFolder
```

- 

- rmdir

- **Syntax:**rmdir<directory-name>

- Removes an empty directory.

Example:

```
bash
```

Copy code

```
rmdirMyFolder
```

- 

- touch

- **Syntax:**touch <file-name>

- Creates an empty file.



Example:

bash

touch file.txt

- 

- **rm**

- **Syntax:**rm<file-name>

- Deletes a file.

Example:

bash

rm file.txt

- 

**Remove a directory with its contents:**

bash

rm -r MyFolder

- 

#### 4. **Managing Permissions:**

- **chmod**

- **Syntax:**chmod [permissions] <file-name>

- Changes the permissions of a file or directory.

Example:

bash

chmod 755 file.txt

- 

- **ls -l**

- **Syntax:**ls -l [path]

- Lists files and directories with their permissions.

#### 5. **Performing Administrative Tasks with sudo:**

- **Updating Packages:**

- **Syntax:**sudo apt update

Example:

bash



```
sudo apt update
```

- 

- **Installing a Package:**

- **Syntax:**sudo apt install <package-name>

Example:

```
bash
```

```
sudo apt install vim
```

- 

## 6. Managing Users and Groups:

- **Add a User:**

- **Syntax:**sudoadduser<username>

Example:

```
bash
```

```
sudoadduserJohnDoe
```

- 

- **Delete a User:**

- **Syntax:**sudodeluser<username>

Example:

```
bash
```

```
sudodeluser Johnson
```

- 

- **Modify a User's Group:**

- **Syntax:**sudousermod -aG<groupname><username>

Example:

```
bash
```

```
sudousermod -aGsudo Johnson
```

- 

## 7. Closing the Terminal:

- **Syntax:**exit

Example:

```
bash
```

```
exit
```

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## Practical 4

# EXECUTING SQL STATEMENTS FOR DATABASE CREATION AND MANIPULATION

### OBJECTIVES

After completing this practical, you will be able to:

- Execute SQL statements for creating databases and tables;
- Perform data manipulation operations such as inserting, updating, and deleting records.

### PROCEDURE/ACTIVITY

#### 1. Open the SQL Environment:

- Use an open-source database management system like MySQL or PostgreSQL.
- Launch the database client or terminal.

#### 2. Creating a Database:

##### Syntax:

```
CREATE DATABASE <database_name>;
```

Example:

```
CREATE DATABASE School;
```

#### 3. Using the Database:

##### Syntax:

```
USE <database_name>;
```



Example:

```
USE School;
```

#### 4. Creating a Table:

**Syntax:**

```
CREATE TABLE <table_name> (  
    column1datatype,  
    column2datatype,  
    ...  
);
```

Example:

```
CREATE TABLE Students (  
    ID INT PRIMARY KEY,  
    Name VARCHAR(100),  
    Age INT,  
    Grade VARCHAR(10)  
);
```

#### 5. Inserting Data:

**Syntax:**

```
INSERT INTO <table_name> (column1, column2, ...) VALUES (value1,  
value2, ...);
```

Example:

```
INSERT INTO Students (ID, Name, Age, Grade) VALUES (1, 'John Doe',  
18, 'A');
```

#### 6. Updating Data:

**Syntax:**

```
UPDATE <table_name> SET column1 = value1 WHERE condition;
```

Example:

```
UPDATE Students SET Grade = 'B' WHERE ID = 1;
```



Notes

7. Deleting Data:

Syntax:

DELETE FROM <table\_name> WHERE condition;

Example:

DELETE FROM Students WHERE ID = 1;

8. Viewing Data:

Syntax:

SELECT \* FROM <table\_name>;

Example:

SELECT \* FROM Students;

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## Practical 5

# CONFIGURING IP ADDRESS IN WINDOWS AND LINUX

### OBJECTIVE

After completing this practical, you will be able to:

- Configure an IP address manually in Windows and Linux.

### PROCEDURE/ACTIVITY

#### 1. Configuring IP Address in Windows

- Open Command Prompt as Administrator.
- **Static IP Address Configuration:**

#### Syntax:

```
netsh interface ip set address "Ethernet" static <IP><Subnet><Gateway>
```

○

Example:

```
netsh interface ip set address "Ethernet" static 192.168.1.10 255.255.255.0 192.168.1.1
```

○

- **View Configuration:**

#### Syntax:

```
ipconfig
```

○



## 2. Configuring IP Address in Linux:

- Open the terminal.
- **Static IP Configuration:**

### Syntax:

```
sudoifconfig<interface><IP>netmask<Subnet>
```

○

Example:

```
sudoifconfig eth0 192.168.1.10 netmask 255.255.255.0
```

○

- **Viewing Current Configuration:**

### Syntax:

```
ifconfig
```

## 3. Switching between IP configuration:

### On Windows

#### Switch to Dynamic IP (DHCP):

- Open the Control Panel.
- Go to Network and Sharing Center> Change adapter settings.
- Right-click on the active network adapter (e.g., Ethernet or Wi-Fi) and select Properties.
- Select Internet Protocol Version 4 (TCP/IPv4) and click Properties.
- Choose:
- Obtain an IP address automatically.
- Obtain DNS server address automatically.
- Click OK to save changes.

#### Switch to Static IP:

- Open the Control Panel.
- Go to Network and Sharing Center> Change adapter settings.
- Right-click on the active network adapter (e.g., Ethernet or Wi-Fi) and select Properties.
- Select Internet Protocol Version 4 (TCP/IPv4) and click Properties.
- Select:



- Use the following IP address.
- Enter the IP address, subnet mask, and default gateway.
- Enter the DNS server addresses.
- Click OK to save changes.

### On Linux (Ubuntu/Debian-based)

#### Switch to Dynamic IP (DHCP):

- Open the terminal and edit the network configuration file:

```
bash
```

```
sudo nano /etc/netplan/01-netcfg.yaml
```

- Replace the static configuration with:

```
yaml
```

```
network:
```

```
version: 2
```

```
ethernets:
```

```
enp0s3:
```

```
dhcp4: true
```

- Replace enp0s3 with your network adapter name.
- Apply the changes:

```
bash
```

```
sudo netplan apply
```

Switch to Static IP:

- Edit the same file:

```
bash
```

```
sudo nano /etc/netplan/01-netcfg.yaml
```

- Configure a static IP:

```
yaml
```

```
network:
```

```
version: 2
```

```
ethernets:
```

```
enp0s3:
```



Notes

addresses: [192.168.1.100/24]

gateway4: 192.168.1.1

nameservers:

addresses: [8.8.8.8, 8.8.4.4]

- Replace enp0s3 with your adapter name and the IP details with your network specifics.
- Apply the changes:

bash

sudo netplan apply

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## Practical 6

# SECURE ROUTER CONFIGURATION IN BRIDGE AND HUB MODES

### OBJECTIVE

After completing this practical, you will be able to:

- Configure a secure router in bridge and hub modes.

### PROCEDURE/ACTIVITY

#### 1. Access the Router Interface:

- Connect to the router's IP address through a web browser (e.g., 192.168.1.1).
- Login using the administrator credentials.

#### 2. Enable Bridge Mode:

- Navigate to **Wireless Settings ! Operation Mode !** Select **Bridge Mode**.
- Set the SSID and password for secure connection.

#### 3. Enable Hub Mode (AP Mode):

- Navigate to **Operation Mode !** Select **Access Point Mode (AP Mode)**.
- Configure the network SSID and secure it using WPA3 encryption.

#### 4. Save and Reboot the Router:

- Save the settings and reboot the router to apply the changes.



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## Practical 7

# EXECUTING NETWORKING COMMANDS

### OBJECTIVE

After completing this practical, you will be able to:

- Execute and understand basic networking commands.

### PROCEDURE/ACTIVITY:

#### 1. View IP Configuration:

Windows:

`ipconfig`

Linux:

`ifconfig`

#### 2. Ping a Website or IP Address:

Syntax:

`ping <hostname or IP>`

Example:

`ping google.com`

Know about IP address of any website in your system

- Press Windows + R, type `cmd`, and press Enter to open Command Prompt.
- Type the following command and press Enter:



Notes

**ping google.com**

- The output will show the IP address of Google's server, e.g., 142.250.190.14.

**3. Check Network Route:**

**Syntax:**

tracert<hostname> # Windows

tracertoute<hostname> # Linux

**LEARNER'S OBSERVATIONS**

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## Practical 8

# DESIGN AND DEVELOP WEB PAGES USING HTML (BASIC TAGS)

### Objectives

After completing this practical, you will be able to:

- Create a basic webpage using HTML.
- Use basic HTML tags for form elements like login, submit buttons, and GET/POST functions.

### PROCEDURE/ACTIVITY:

#### 1. Create an HTML File:

- Open a text editor (e.g., Notepad++, VS Code, or any open-source editor).
- Save the file as form.html.

#### 2. Write Basic HTML Code:

##### Syntax:

```
<!DOCTYPE html>
```

```
<html>
```

```
<head>
```

```
<title>Login Form</title>
```

```
</head>
```

```
<body>
```

```
<h1>Login Page</h1>
```



```
<form action="/submit" method="POST">
<label for="username">Username:</label>
<input type="text" id="username" name="username" required><br><br>
<label for="password">Password:</label>
<input type="password" id="password" name="password"
required><br><br>
<button type="submit">Login</button>
</form>
</body>
</html>
```

○

### 3. Run the HTML File:

- Open the file in a web browser to view the form.

### 4. HTML Structure Tags

**<html>**: Defines the root of an HTML document.

```
<html>...</html>
```

**<head>**: Contains metadata and links to styles or scripts.

```
<head>...</head>
```

**<body>**: Contains the visible content of the webpage.

```
<body>...</body>
```

### 5. Formatting Tags

**<h1> to <h6>**: Defines headings, <h1> being the largest.

```
<h1>Heading 1</h1>
```

```
<h2>Heading 2</h2>
```

**<p>**: Defines a paragraph.

```
<p>This is a paragraph.</p>
```

**<b>**: Makes text bold.

```
<b>Bold Text</b>
```

**<i>**: Makes text italicized.

```
<i>Italic Text</i>
```



## 6. Link and Image Tags

**<a>**: Creates a hyperlink.

```
<a href="https://example.com">Visit Example</a>
```

**<img>**: Embeds an image.

```
<imgsrc="image.jpg" alt="Description">
```

## 7. List Tags

**<ul>**: Defines an unordered list.

```
<ul>
```

```
<li>Item 1</li>
```

```
<li>Item 2</li>
```

```
</ul>
```

**<ol>**: Defines an ordered list.

```
<ol>
```

```
<li>First</li>
```

```
<li>Second</li>
```

```
</ol>
```

## 8. Table Tags

**<table>**: Creates a table.

```
<table>
```

```
<tr>
```

```
<th>Header 1</th>
```

```
<th>Header 2</th>
```

```
</tr>
```

```
<tr>
```

```
<td>Data 1</td>
```

```
<td>Data 2</td>
```

```
</tr>
```

```
</table>
```



Notes

## 9. Form Tags

**<form>**: Creates a form for user input.

```
<form action="/submit" method="post">
```

```
<input type="text" name="name" placeholder="Enter Name">
```

```
<button type="submit">Submit</button>
```

```
</form>
```

### LEARNER'S OBSERVATIONS

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## Practical 9

# WEB APPLICATION CONNECTIVITY WITH DATABASE USING HTML

### OBJECTIVE

After completing this practical, you will be able to:

- Connect a basic web application to a database.

### PROCEDURE/ACTIVITY

#### 1. Set Up a Web Server and Database:

- Install an open-source web server like XAMPP.
- Create a database using MySQL.

#### 2. Create an HTML File:

Write a simple form for data entry:

```
<!DOCTYPE html>
<html>
<head>
<title>Database Form</title>
</head>
<body>
<form action="submit.php" method="POST">
<label for="name">Name:</label>
<input type="text" id="name" name="name" required><br><br>
<button type="submit">Submit</button>
</form>
</body>
</html>
```



Notes

### 3. Create a PHP Script for Database Connectivity:

Save this file as submit.php:

```
<?php
$conn = new mysqli("localhost", "root", "", "testdb");
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}
$name = $_POST['name'];
$sql = "INSERT INTO users (name) VALUES ('$name')";
if ($conn->query($sql) === TRUE) {
    echo "Record added successfully";
} else {
    echo "Error: " . $sql . "<br>" . $conn->error;
}
$conn->close();
?>
```

### LEARNER'S OBSERVATIONS

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## Practical 10

# DEMONSTRATION OF BROWSER AND EMAIL PRIVACY AND SECURITY SETTINGS

### OBJECTIVE

After completing this practical, you will be able to:

- Configure browser and email security settings.

### PROCEDURE/ACTIVITY

#### 1. Browser Security Settings:

- Open a browser (e.g., Firefox, Chrome).
- Navigate to **Settings > Privacy and Security**.
- Enable the following:
  - **Block third-party cookies.**
  - **Enable HTTPS-Only mode.**
  - **Clear browsing data on exit.**

#### 2. Email Privacy Settings:

- Open an email client (e.g., Thunderbird).
- Enable two-factor authentication (2FA).
- Configure spam and phishing filters.



Notes

### Check to enable two-factor authentication:

- **Access Your Email Account Settings:**
  - Log in to your email account (e.g., Gmail, Yahoo).
  - Navigate to the **Security** or **Account Settings** section.
- **Enable 2FA:**
  - Locate the **Two-Factor Authentication** or **2-Step Verification** option.
  - Click **Enable** or **Turn On** and follow the on-screen instructions.
- **Choose an Authentication Method:**
  - Select an authentication method, such as SMS (receiving a code via text), an authenticator app (e.g., Google Authenticator), or a hardware security key.
- **Verify and Save Settings:**
  - Complete the verification process by entering the code sent to your phone or generated by the app.
  - Save the settings to enable 2FA.
- **Test the Setup:**
  - Log out and log back in to ensure 2FA is functioning as expected, requiring the second layer of authentication.

### LEARNER'S OBSERVATIONS

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## Practical 11

### PREPARATION OF RESUME

#### OBJECTIVE

After completing this practical, you will be able to:

- Create a professional resume using open-source software.

#### PROCEDURE/ACTIVITY

##### 1. Open LibreOffice Writer:

- Use a resume template or design one manually.

##### 2. Add Key Sections:

- **Header:** Name, contact details, and LinkedIn profile.
- **Objective:** A brief statement about your career goals.
- **Education:** List academic qualifications.
- **Skills:** Mention relevant skills.
- **Experience:** Add details of past roles and responsibilities.
- **Achievements:** Highlight key accomplishments.

##### 3. Save and Export:

- Save the file as Resume.odt and export as a PDF.

#### LEARNER'S OBSERVATIONS

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Notes

## Practical 12

### APPLYING FOR A JOB

#### OBJECTIVE

After completing this practical, you will be able to:

- Apply for jobs using online job portals.

#### PROCEDURE/ACTIVITY

1. **Register on Job Portals:**

- Sign up on websites which are job providers and keep updating resumes.

2. **Upload Your Resume:**

- Complete your profile and attach your resume.

3. **Search and Apply for Jobs:**

- Use filters to find relevant opportunities.

#### LEARNER'S OBSERVATIONS

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Notes

## Practical 13

### MOCK INTERVIEWS

#### OBJECTIVE

After completing this practical, you will be able to:

- Gain confidence by participating in mock interviews.

#### PROCEDURE/ACTIVITY

##### 1. Set Up a Mock Interview:

- Conduct it with peers or mentors.
- Use a video conferencing tool like Zoom.

##### 2. Practice Common Questions:

- Introduce yourself.
- Explain your skills and experiences.

#### LEARNER'S OBSERVATIONS

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Notes

## Practical 14

# DEMONSTRATION OF PASSWORD STRENGTH CHECKER AND MANAGEMENT SOFTWARE

### OBJECTIVE

After completing this practical, you will be able to:

- Use password strength checkers and management tools.

### PROCEDURE/ACTIVITY

#### 1. Password Strength Checker:

- Use an online tool like Bitwarden or KeePass.
- Test weak and strong passwords.

#### 2. Password Manager Setup:

- Install open-source software like KeePass.
- Create and store secure passwords.

### LEARNER'S OBSERVATIONS

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Notes

## Practical 15

### USING OPEN-SOURCE SOFTWARE

#### OBJECTIVE

After completing this practical, you will be able to:

- Use open-source software for various tasks.

#### PROCEDURE/ACTIVITY

##### 1. Install Open-Source Software:

- Examples: GIMP (image editing), LibreOffice (document editing).

##### 2. Perform Basic Tasks:

- Edit an image in GIMP.
- Create a document in LibreOffice.

#### LEARNER'S OBSERVATIONS

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## Practical 16

# DEMONSTRATION OF TOOLS FOR CYBERSECURITY THREATS AND ATTACKS (USING OPEN- SOURCE SOFTWARE)

### OBJECTIVE

After completing this practical, you will be able to:

- demonstrate tools used in detecting and analyzing cybersecurity threats such as malware, DoS attacks, phishing, spoofing, and more.

### PROCEDURE/ACTIVITY

#### 1. Malware Detection with ClamAV:

##### Install ClamAV:

```
sudo apt install clamav
```

○

##### Scan Files:

```
clamscan -r /path/to/scan
```

○

#### 2. DoS Attack Simulation with Hping3:

##### Install Hping3:

```
sudo apt install hping3
```

○

##### Simulate DoS Attack:

```
hping3 -S -p 80 -c 1000 <target_IP>
```

○



Notes

### 3. Phishing and Spoofing Detection with Wireshark:

#### Install Wireshark:

`sudo apt install wireshark`

- 
- **Monitor Phishing Activity** using Wireshark for suspicious packets.

### 4. IoT-Based Attacks:

- **Monitor IoT Traffic** using Wireshark to identify unusual patterns.

### 5. Ransomware Behavior with Cuckoo Sandbox:

- Set up **Cuckoo Sandbox** (open-source malware analysis tool) to analyze ransomware behavior in a controlled environment.

### 6. Vishing and Juice Jacking Detection:

Use **USBGuard** to protect from juice jacking:

`sudo apt install usbguard`

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### LEARNER'S OBSERVATIONS

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## Practical 17

# DEMONSTRATION OF TOOLS BASED ON CRYPTOGRAPHY (USING OPEN- SOURCE SOFTWARE)

### OBJECTIVE

After completing this practical, you will be able to:

- Use open-source tools to perform encryption, decryption, and understand cryptographic concepts.

### PROCEDURE/ACTIVITY

1. Encryption and Decryption with GPG (GNU Privacy Guard):

#### **Install GPG:**

```
sudo apt install gnupg
```

○

#### **Generate Key Pair:**

```
gpg-gen-key
```

○

#### **Encrypt a File:**

```
gpg-encrypt-recipient "recipient_email" file.txt
```

○

#### **Decrypt a File:**

```
gpg-decrypt file.txt.gpg
```

○



Notes

2. AES Encryption with OpenSSL:

Install OpenSSL:

```
sudo apt install openssl
```

○

Encrypt with AES:

```
opensslenc-aes-256-cbc -in file.txt -out file.enc
```

○

Decrypt the File:

```
opensslenc -aes-256-cbc -d -in file.enc -out file.txt
```

LEARNER’S OBSERVATIONS

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## Practical 18

# INSTALL AND CONFIGURE A PERSONAL FIREWALL (USING UFW)

### OBJECTIVE

After completing this practical, you will be able to:

- Install and configure open-source firewall software and create inbound and outbound rules.

### PROCEDURE/ACTIVITY

#### 1. Install UFW (Uncomplicated Firewall):

##### Install UFW:

```
sudo apt install ufw
```

○

##### Enable UFW:

```
sudo ufw enable
```

○

#### 2. Create Inbound and Outbound Rules:

##### Allow SSH Access:

```
sudo ufw allow ssh
```

○

##### Deny Outbound HTTP Access:

```
sudo ufw deny out 80
```

○



Notes

### 3. Check UFW Status:

**Command:**

`sudo ufw status`

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### LEARNER'S OBSERVATIONS

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## Practical 19

# SECURE ROUTER CONFIGURATION (USING OPENWRT)

### OBJECTIVE

After completing this practical, you will be able to:

- configure a router using open-source firmware like OpenWRT.

### PROCEDURE/ACTIVITY

#### 1. Install OpenWRT:

- Flash OpenWRT firmware onto a supported router.

#### 2. Configure Security Settings:

Access the router's web interface at:

<http://192.168.1.1>

- 
- Change the admin password.
- Enable WPA3 encryption for Wi-Fi.

#### 3. Network Segmentation with VLANs:

- Set up VLANs to segregate network traffic for security.

### LEARNER'S OBSERVATIONS

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## Practical 20

# DEMONSTRATION OF VAPT (VULNERABILITY ASSESSMENT AND PENETRATION TESTING) TOOLS

### OBJECTIVE

After completing this practical, you will be able to:

- Use open-source VAPT tools like Nmap, Nessus, and Wireshark for vulnerability scanning and network analysis.

### PROCEDURE/ACTIVITY:

#### 1. Install and Use Nmap for Network Scanning:

##### Install Nmap:

```
sudo apt install nmap
```

○

##### Scan a Network for Open Ports:

```
nmap -p 1-65535 <target_IP>
```

○

#### 2. Use Nessus for Vulnerability Scanning:

- Download and install **Nessus Essentials** (free version).
- Set up vulnerability scans on a network.



Notes

### 3. Network Analysis with Wireshark:

#### Install Wireshark:

```
sudo apt install wireshark
```

- 
- **Monitor Network Traffic** using Wireshark to capture suspicious packets.

#### LEARNER'S OBSERVATIONS

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## Practical 21

# OPERATE TOOLS FOR LOG ANALYSIS (WINDOWS AND LINUX LOGS)

### OBJECTIVE

After completing this practical, you will be able to:

- Use open-source tools to analyze logs in both Windows and Linux environments.

### PROCEDURE/ACTIVITY

#### 1. Analyze Windows Event Logs:

- Use **Event Viewer** (built-in tool) in Windows to monitor and filter security logs.

#### 2. Linux Log Analysis with Built-in Tools:

**dd** (Data Dump):

```
dd if=/dev/sda of=backup.img
```

- 

**df** (Disk Usage):

```
df -h
```

- 

**du** (Disk Usage of Files):

```
du -sh /path/to/directory
```

-



Notes

**grep** (Search Logs):

grep "error" /var/log/syslog

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**tail** (Monitor Log Files):

tail -f /var/log/auth.log

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### LEARNER'S OBSERVATIONS

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## Practical 22

# DEMONSTRATION OF ANTIVIRUS TOOLS (OPEN-SOURCE)

### OBJECTIVE

After completing this practical, you will be able to:

- Install and configure an open-source antivirus tool.

### PROCEDURE/ACTIVITY

#### 1. Install ClamAV:

##### Install ClamAV:

```
sudo apt install clamav
```

○

##### Update Database:

```
sudofreshclam
```

○

##### Scan a Directory for Malware:

```
clamscan -r /path/to/scan
```

### LEARNER'S OBSERVATIONS

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## Practical 23

# DEMONSTRATION OF SECURE USAGE GUIDELINES FOR SOCIAL MEDIA

### OBJECTIVE

After completing this practical, you will be able to:

- Understand and demonstrate secure usage guidelines for social media platforms.

### PROCEDURE/ACTIVITY:

#### 1. Review Social Media Security Settings:

- Enable Two-Factor Authentication (2FA) for platforms like Facebook, Twitter, and Instagram.
- Set privacy settings to limit profile visibility.
- Avoid sharing sensitive personal information.

#### 2. Social Media Phishing Detection:

- Be cautious of unsolicited messages.
- Review links before clicking to avoid phishing attacks.

### LEARNER'S OBSERVATIONS

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## Practical 24

# DEMONSTRATION OF IT ACT AND IT RULES 2021

### OBJECTIVE

After completing this practical, you will be able to:

- demonstrate the legal framework for cybersecurity as per the IT Act and IT Rules 2021.

### PROCEDURE/ACTIVITY

#### 1. Study IT Act 2000 and IT Rules 2021

- Understand key provisions such as Section 66 (Cybercrimes), Section 43 (Penalty for damage to computer systems), and Section 72A (Breach of confidentiality).

#### 2. Implement Security Best Practices

- Follow the data protection rules as per the IT Act and implement necessary organizational policies.

### LEARNER'S OBSERVATIONS

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