1.0) AIM: Demonstration of Confidentiality ,Integrity and Availability(CIA Triad)

2.0) OBJECTIVE:

To demonstrate the three key principles of information security — Confidentiality, Integrity, and Availability — on a Windows system.

3.0) SCOPE:

- This practical provides a **hands-on understanding** of the **CIA Triad**, the foundation of information security.
- It demonstrates how even **basic built-in Windows tools** (permissions, hashing, backup/restore) can implement professional security practices.
- Students will be able to relate **theory of CIA triad** to **real-world system security tasks**.

4.0) FACILITIES/ APPARATUS:

- Windows 10/11 PC (student account + administrator account)
- Built-in Windows Security tools (no external software needed)

5.0) THEORY:

The CIA Triad is the core model of Information Security:

Confidentiality

Ensures that only authorized users can access sensitive data.

Achieved using permissions, authentication, and encryption.

Example: Restricting payroll file access to HR only.

Integrity

Ensures that data remains accurate, consistent, and tamper-free.

Verified using hashing, checksums, and digital signatures.

Example: Detecting unauthorized modification of payroll data.

Availability

Ensures that information and resources are accessible when needed.

Achieved using backups, redundancy, and recovery mechanisms.

Example: Restoring payroll data from a backup after deletion.

Together, CIA ensures a secure, reliable, and trustworthy information system.

6.0) STEPS

A. Confidentiality

Create a folder on the desktop named SecureData.

Inside SecureData, create a file payroll.txt and add any sample data (e.g., employee names and salaries).

Restrict access:

Right-click the folder → Properties → Security tab.

Click Edit → remove "Everyone" or unwanted users.

Add only your current user account with Full control.

Test: Log in as another standard user (or ask a friend to try) — they should get Access Denied.

B. Integrity

Open Command Prompt (as your user).

Generate a file hash:

certutil -hashfile "C:\Users\<YourUser>\Desktop\SecureData\payroll.txt" SHA256

(Copy the hash value to a text file for reference.)

Modify the payroll.txt file (change a salary value).

Generate the hash again and compare — it should be different.

C. Availability

Create a backup of SecureData by right-clicking → Send to → Compressed (zipped) folder.

Delete the original SecureData folder.

Extract the backup ZIP to restore the folder.

Open the file and verify the data is intact.

7.0) CONCULSION

Successfully demonstrated Confidentiality, Integrity, and Availability using simple Windows features.