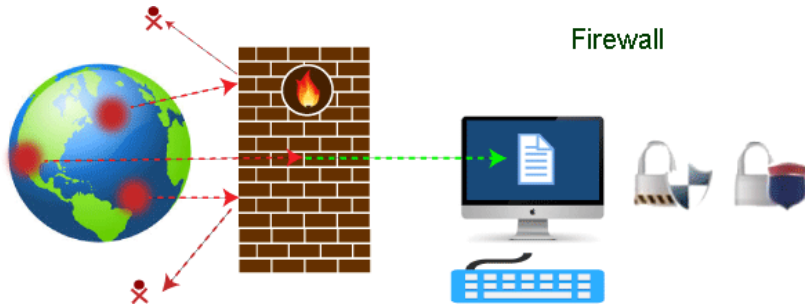
# Practical No.10

## AIM: Study of firewalls in providing network security.

### What is a Firewall?

A firewall can be defined as a special type of network security device or a softwareprogram that monitors and filters incoming and outgoing network traffic based on a defined set of security rules. It acts as a barrier between internal private networks and external sources (such as the public Internet).

The primary purpose of a firewall is to allow non-threatening traffic and prevent malicious or unwanted data traffic for protecting the computer from viruses and attacks. A firewall is a cybersecurity tool that filters network traffic and helps users block malicious softwarefrom accessing the Internet in infected computers.




**Firewall: Hardware or Software**

As stated above, a firewall can be a network security device or a software program on a computer. This means that the firewall comes at both levels, i.e., hardware and software, though it's best to have both.

Each format (a firewall implemented as hardware or software) has different functionalitybut the same purpose. A hardware firewall is a physical device that attaches betweena computer network and a gateway. For example, a broadband router. On the other hand,a software firewall is a simple program installed on a computer that works through port numbers and other installed software.

Apart from that, there are cloud-based firewalls. They are commonly referred to as FaaS (firewall as a service). A primary advantage of using cloud-based firewalls is that they canbe managed centrally. Like hardware firewalls, cloud-based firewalls are best known for providing perimeter security.

**Why Firewall**

Firewalls are primarily used to prevent malware and network-based attacks. Additionally,they can help in blocking application-layer attacks. These firewalls act as a gatekeeper ora barrier. They monitor every attempt between our computer and another network. Theydo not allow data packets to be transferred through them unless the data is coming or going from a user-specified trusted source.

Firewalls are designed in such a way that they can react quickly to detect and counter- attacks throughout the network. They can work with rules configured to protect the network and perform quick assessments to find any suspicious activity. In short, we can point to the firewall as a traffic controller.

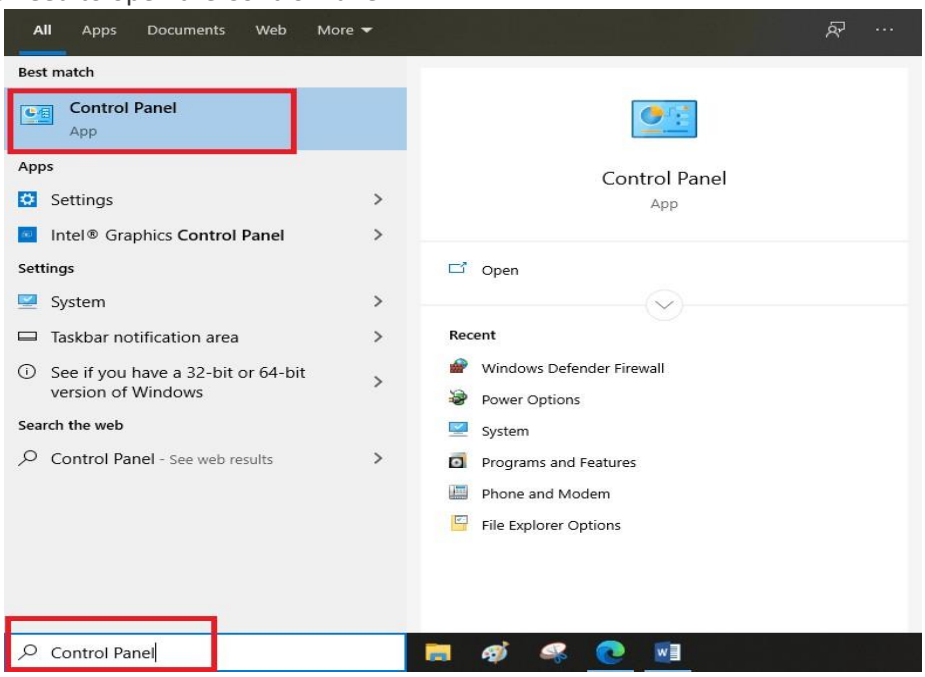
**Working of Firewall with Windows**

A firewall is the first line of control when it comes to the security of computers. It is designed to keep unauthorized users away from accessing files and resources stored on the computer system. There can be several reasons why a user might want to disable the firewall, especially when a userwants to try another firewall program.

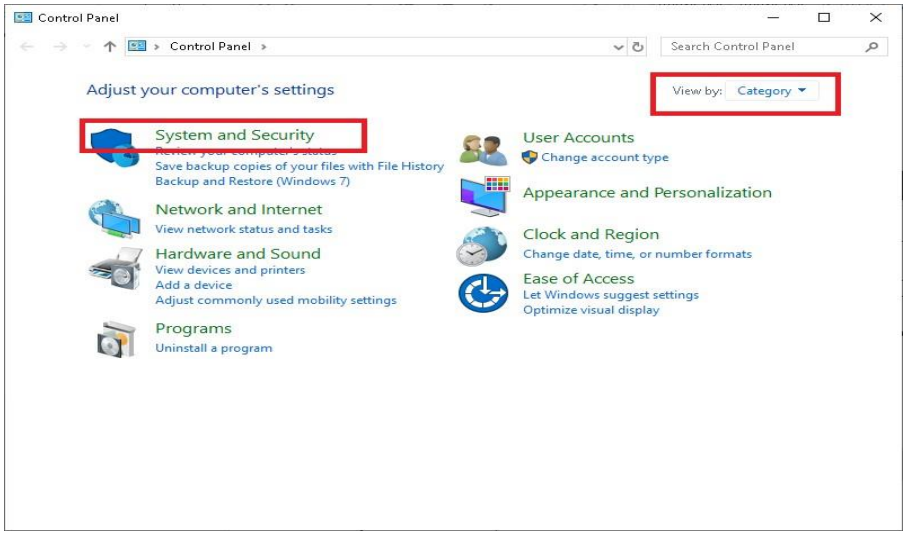
***Note**: It is not good to disable Windows Firewall unless there is another security program (with additional firewall support) running on the computer*

Following are steps to disable a firewall:

**Step 1:** First, we need to open the Control Panel.

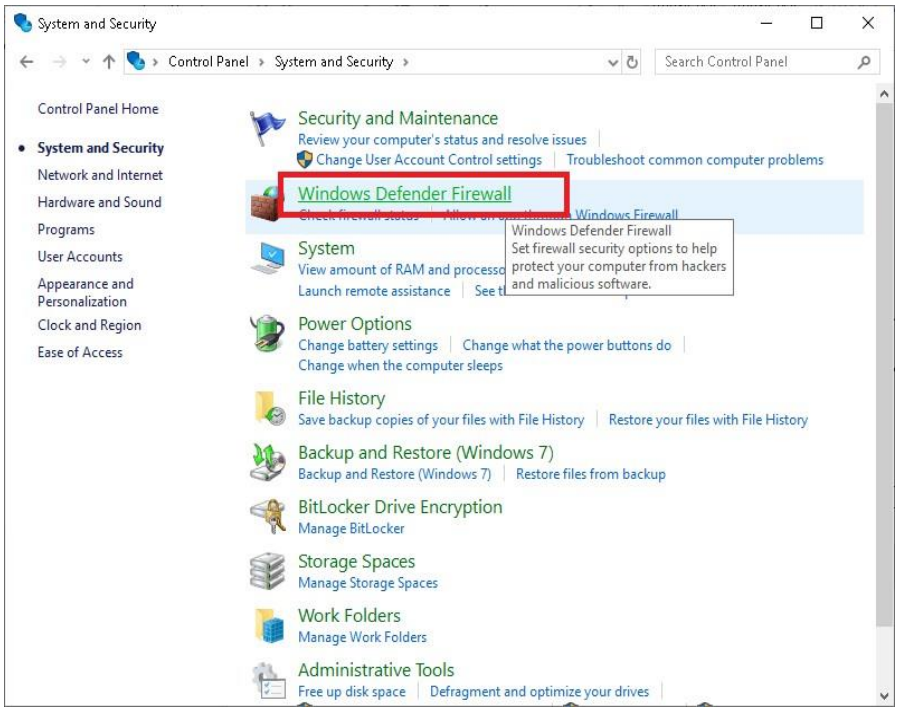



**Step 2:** After that, we are required to click on the Control Panel to open its settings. The controlpanel contains the following options:



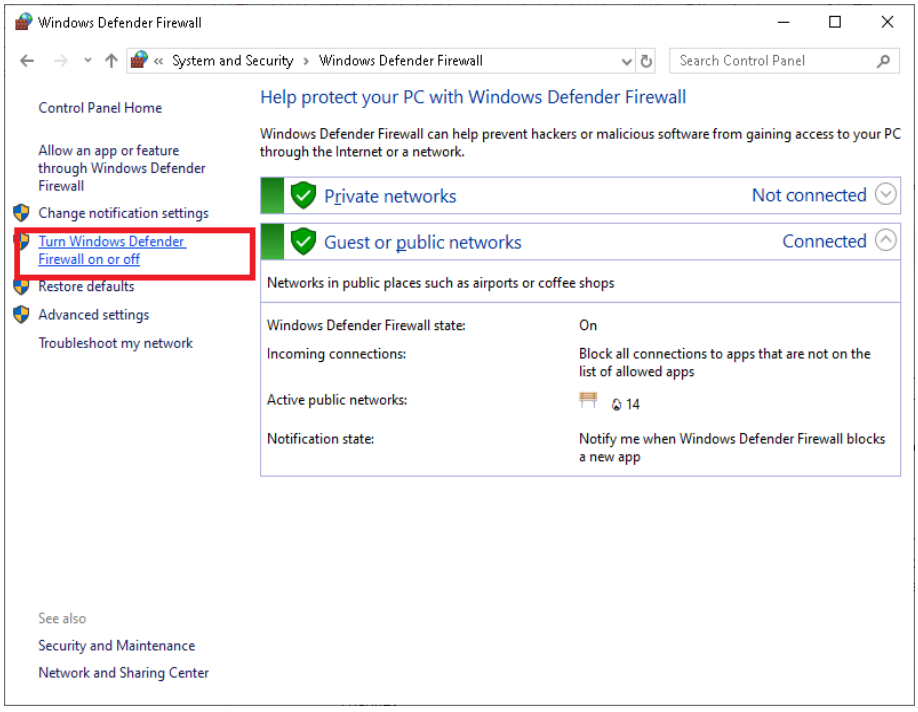

Here, we need to click on **'System and Security'**. This option is only visible if the 'view by:' optionis set as 'Category'.

**Step 3:** Next, we need to click on **'Windows Defender Firewall'**, as shown below:

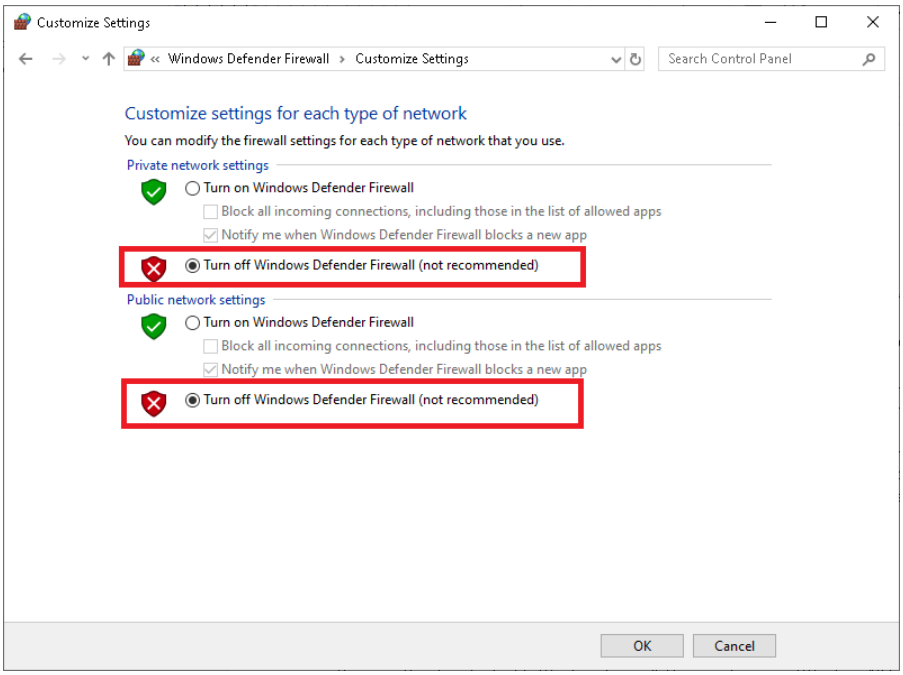



***Note: In some computers, the option of 'Windows Defender Firewall' might instead be displayedas 'Windows Firewall'***

**Step 4:** We are then required to click on **'Turn Windows Defender Firewall on or off'**. This optionis shown in the left side panel of the screen:

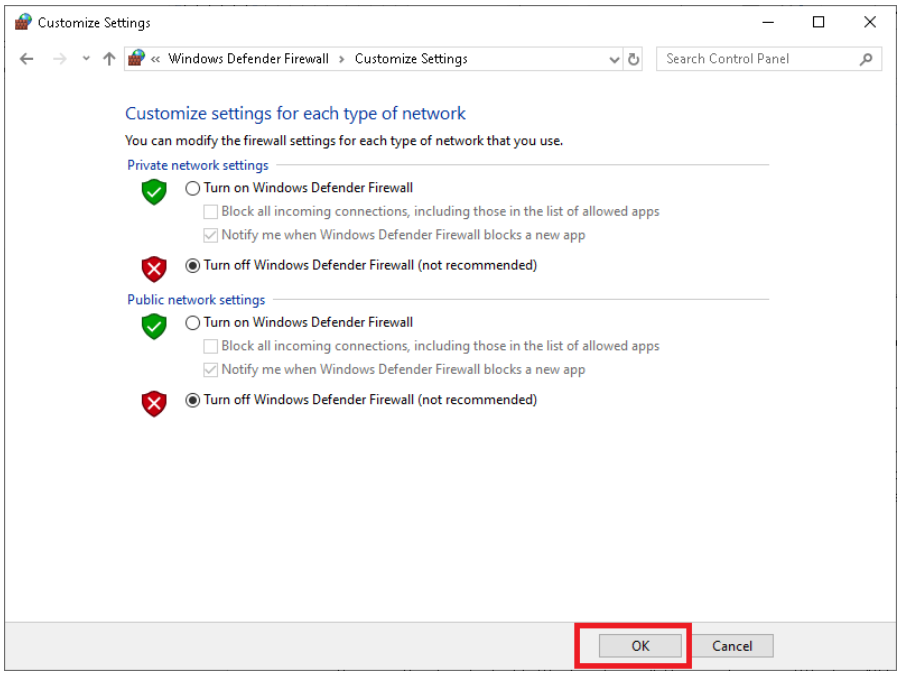



**Step 5:** On the next screen, we need to click on the circle radio button next to **'Turn off WindowsDefender Firewall (not recommended)'**.




Here, we can select the firewall settings for different types of networks. Using this screen, we can turn off or disable the firewall for private networks, public networks, or both. We need to select the circle radio button next to 'Turn off Windows Defender Firewall (not recommended)' under both the private and the public network settings.

**Step 6:** After selecting the radio buttons, we are required to click on the **'OK'** button to keep the changes.




These are the steps to disable Windows Firewall.

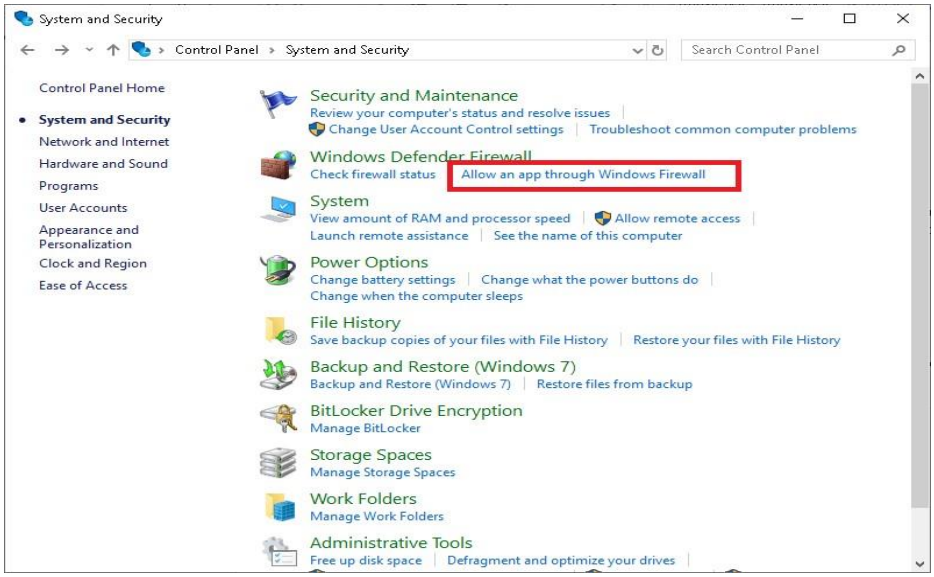
**Caution**

Suppose there is any program that is unable to access the Internet. In that case, it is better to allowthat specific program through the firewall rather than disabling the entire firewall system. Here arethe steps to allow any program through Windows Firewall:

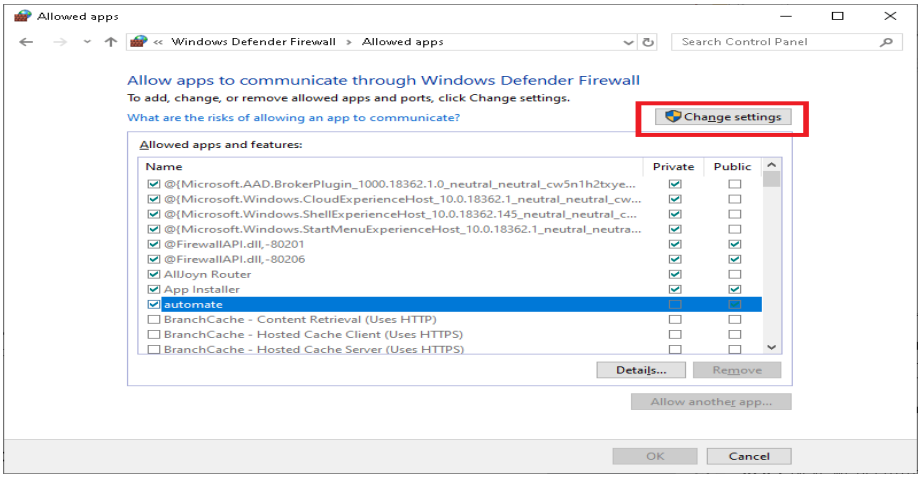
**Step 1:** First, we need to open a Control Panel.

**Step 2:** On the next screen, we need to click on **'System and Security'**.

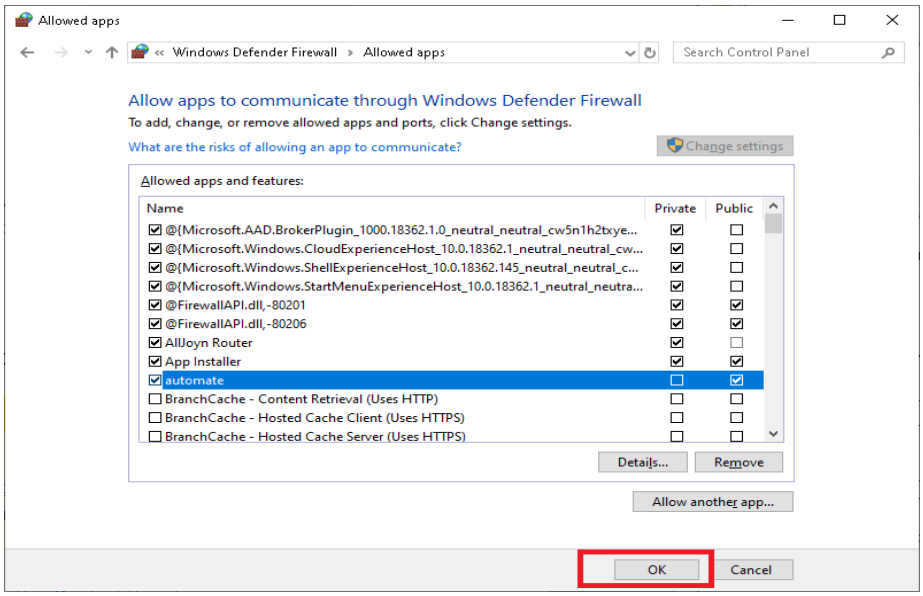
**Step 3:** After that, we are required to click on **'Allow an app through Windows Firewall'**. This optionis displayed under **'Windows Defender Firewall'** option, as shown below:




**Step 4:** After completing the above step, we will get the following screen:



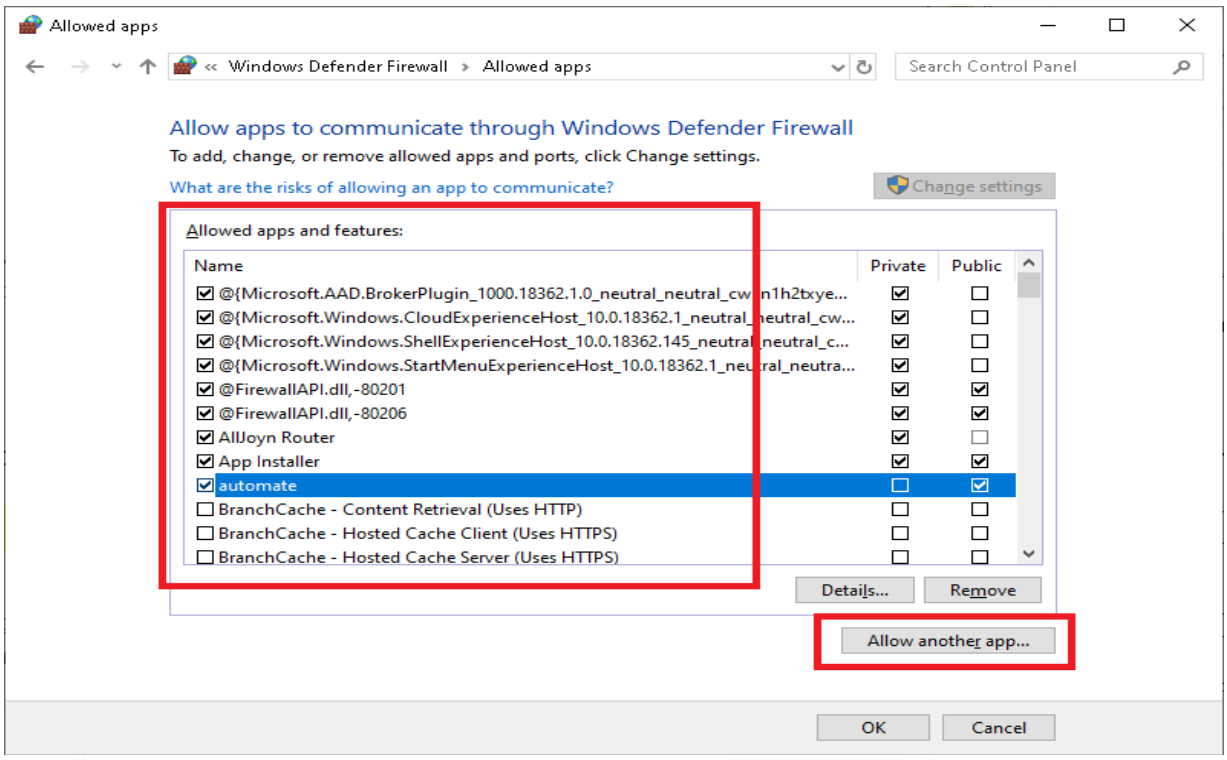

Here, we need to click on the **'Change settings'** button. This will allow us to access the list and modify




its settings.

**Step 5:** Under the list of **'allowed apps and features'**, we can find a specific program to which we want to grant access through the Windows Firewall. After that, we need to select the checkboxes next to that particular program.

Here, we also get options to manage firewall settings for the private network and public network separately. The private box is mostly used for games based on a local area network, while the publicbox is used to allow the program to access the Internet. Besides, if we don't see a required programin the list, we can use the **'Allow another app'** button to add it manually.




**Step 6:** Next, we need to click on the **'OK'** button to keep the changes.

By using this method, we can enable or disable Windows Firewall for specific software. In simple words, the method helps us specify rules for individual programs to allow access to the Internet.

1. Whether a firewall is able to block some specific pages in a web application? Explain
2. What is a Stateful Inspection Firewall?
3. Which type of firewall is more secure, packet filtering firewall or circuit-level gateway, and Why?

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