# 💻 *Windows Fundamentals 2 and 3 – Complete Notes & Lab ( Definitions & Practice )*

## 📝 *Windows Fundamentals 1 – Tasks 1 to 9 (Complete lab)*

### ☑ *Task 1: Introduction to Windows*

***Definition*:**

> **Windows** is a *graphical operating system* developed by **Microsoft**.

- It allows users to **manage hardware and software** using a visual interface.
- It **supports** multitasking, file management, user authentication, and system utilities.

🗟 *Practice Questions & Answers:*

**Q1: What is the purpose of an operating system like Windows?**
**A:** It acts as an `interface between` the user and hardware, managing resources, applications, memory, and user input/output.

**Q2: How do you check the Windows version installed?**
**A:** Use `winver` in the Run dialog (Windows + R) or type `msinfo32` for detailed system info.

**Q3: What type of user interface does Windows provide?**
**A:** Graphical User Interface (GUI)

**Q4: How do you open the Command Prompt in Windows?**
**A:** Press `Windows + R`, type `cmd`, and press Enter.

**Q5: What is NTFS?**
**A:** New Technology File System – used by Windows for secure and efficient file storage.

**Q6: Which utility shows complete system hardware and OS details?**
**A:** System Information – `msinfo32`

**Q7: What key combination opens Task Manager?**
**A:** `Ctrl + Shift + Esc`

**Q8: How do you shut down or restart the system using CMD?**
**A:** Use `shutdown /s` to shut down and `shutdown /r` to restart.

**Q9: How can you open Windows Settings quickly?**
**A:** `Windows + I`

**Q10: What distinguishes Windows from command-line-based systems?**
**A:** It provides a GUI that simplifies operations through clicks and menus instead of typed commands.

## ☑️ *Task 2: Windows Editions*

### *Definition*:

> **Windows** comes in different editions such as `Home, Pro, Enterprise, and Education`.

- Each tailored for different users and organizations with varied features and capabilities.

### 🗄️ *Practice Questions & Answers:*

**Q1: How can you check which edition of Windows is installed?**
**A:** Open Run (`Windows + R`), type `winver`, or go to `Settings > System > About`.

**Q2: What feature is available in Windows Pro but not in Home?**
**A:** BitLocker, Group Policy Editor, and Remote Desktop are Pro-exclusive.

**Q3: Can Windows Home be upgraded to Pro?**
**A:** Yes, through the Microsoft Store or by entering a Pro license key.

**Q4: What is the purpose of Windows Enterprise edition?**
**A:** Designed for large organizations with advanced security, virtualization, and IT management features.

**Q5: Which edition is optimized for low-end devices or embedded systems?**
**A:** Windows 10/11 IoT

**Q6: What is the main use of Windows Education edition?**
**A:** It provides Pro features tailored for schools and academic institutions.

**Q7: Is Group Policy Editor available in Windows Home?**
**A:** No, it's only available in Pro and above.

**Q8: What is the default edition for most personal laptops?**
**A:** Windows Home

**Q9: How can you upgrade from Education to Enterprise?**
**A:** Through Volume Licensing or using an Enterprise product key.

**Q10: Which edition is best for server use?**
**A:** Windows Server (separate from desktop editions)

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## ☑️ *Task 3: The Desktop (GUI)*

### *Definition*:

> The **Desktop** is the *primary interface* of Windows where users interact with icons, open applications, manage files, and access the taskbar, Start menu, and system tray.

### 🗄️ *Practice Questions & Answers:*

**Q1: What keyboard shortcut shows the desktop instantly?**
**A:** `Windows + D`

**Q2: How do you open Task View for multitasking?**

**A:** `Windows + Tab`

**Q3: How can you lock your PC instantly?**

**A:** `Windows + L`

**Q4: Which shortcut opens File Explorer directly?**

**A:** `Windows + E`

**Q5: How do you pin an app to the taskbar?**

**A:** Right-click the app icon > "Pin to taskbar"

**Q6: How do you access the notification panel?**

**A:** `Windows + A` or click the notification icon in the system tray.

**Q7: How can you search for apps, files, or settings from the desktop?**

**A:** Click Start and type directly into the search bar.

**Q8: What is the system tray and what does it show?**

**A:** Located at the bottom-right, it shows background app icons, time, volume, and notifications.

**Q9: How do you snap a window to the side of the screen?**

**A:** Drag it to the edge or use `Windows + Left/Right Arrow`.

**Q10: How do you switch between open apps quickly?**

**A:** Press `Alt + Tab`

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## ☑ *Task 4: The File System*

**Definition:**

> The ***file system*** in Windows is the *method by which data is stored and organized on drives*.

- Windows primarily uses ***NTFS*** (New Technology File System), which supports file permissions, encryption, and compression.

### 🗃 *Practice Questions & Answers:*

**Q1: What is NTFS and why is it important?**
**A:** NTFS (New Technology File System) is the default Windows file system that provides support for large files, file permissions, encryption, and efficient storage management.

**Q2: How can you view the contents of a directory from CMD?**
**A:** Use the command `dir`

**Q3: What is the command to change directories?**
**A:** Use `cd foldername` (e.g., `cd Documents`)

**Q4: How do you create a new folder using CMD?**
**A:** Use `mkdir foldername` (e.g., `mkdir MyFolder`)

**Q5: How do you delete a file using CMD?**

**A:** Use `del filename` (e.g., `del notes.txt`)

**Q6: How do you copy a file from one location to another?**

**A:** Use `copy source destination` (e.g., `copy a.txt D:\Backup`)

**Q7: How do you move a file using command line?**

**A:** Use `move source destination` (e.g., `move a.txt D:\Files`)

**Q8: What is the command to view all logical drives?**

**A:** Use `wmic logicaldisk get name`

**Q9: How can you make hidden files visible in File Explorer?**

**A:** Go to `View > Show > Hidden items`

**Q10: How do you copy the full path of a file in GUI?**

**A:** Hold `Shift + Right-click` on the file > Select "Copy as path"

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## ☑️ *Task 5: The Windows\System32 Folder*

***Definition*:**

> `C:\Windows\System32` contains critical system files, executables, drivers, and libraries required for Windows to function properly.

🗄️ ***Practice Questions & Answers:***

**Q1: What is the role of the System32 folder?**

**A:** It holds system-critical files such as `.dll`, `.exe`, and `.sys`, which are required to run Windows services and features.

**Q2: How do you open the System32 folder directly?**

**A:** Press `Windows + R`, type `C:\Windows\System32`, and press Enter.

**Q3: Which command-line tool is located in System32 to open the registry?**

**A:** `regedit.exe`

**Q4: How do you verify the integrity of files in System32?**

**A:** Use `sfc /scannow` in Command Prompt (admin mode).

**Q5: What does `cmd.exe` do and where is it located?**

**A:** It opens the Command Prompt and is located in System32.

**Q6: Name a System32 tool used for process management.**

**A:** `taskmgr.exe` opens Task Manager.

**Q7: What happens if you delete files from System32?**

**A:** The system may become unbootable or highly unstable.

**Q8: How can you list `.dll` files in System32 via CMD?**

**A:** `dir C:\Windows\System32\*.dll /b`

**Q9: What is the purpose of `services.exe` in System32?**

**A:** Manages starting/stopping of system services.

**Q10: Command to check if System32 is being redirected on 64-bit OS?**

**A:** Use `echo %windir%\System32`

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## ☑️ *Task 6: User Accounts, Profiles, and Permissions*

***Definition*:**

> Windows allows ***multiple user accounts*** with unique profiles. Permissions define access rights to files, folders, and system tasks.

🗄️ ***Practice Questions & Answers:***

**Q1: How to create a new local user via command line?**

**A:** `net user username password /add`

**Q2: How to check your current username?**

**A:** `whoami`

**Q3: What is a user profile?**

**A:** It's a folder with a user's desktop, documents, and settings (`C:\Users\Username`).

**Q4: Command to check all users on the system?**

**A:** `net user`

**Q5: How to open Local Users and Groups manager?**

**A:** Run `lusrmgr.msc` (Not available in Home edition)

**Q6: What does NTFS stand for and why is it important?**

**A:** New Technology File System — it supports permissions and encryption.

**Q7: How to view file permissions in GUI?**

**A:** Right-click file > Properties > Security tab

**Q8: How to view access control list via command line?**

**A:** `icacls filename`

**Q9: Which command adds a user to the Administrators group?**

**A:** `net localgroup administrators username /add`

**Q10: What is the SID in Windows?**

**A:** Security Identifier — uniquely identifies users and groups.

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## ☑️ *Task 7: User Account Control (UAC)*

***Definition*:**

> **UAC** is a *Windows security feature* that prevents unauthorized changes to the system by requiring admin approval.

🗄 *Practice Questions & Answers:*

**Q1: How to open UAC settings?**
**A:** `Control Panel > User Accounts > Change UAC settings` or run
`UserAccountControlSettings.exe`

**Q2: What does UAC protect against?**
**A:** Unauthorized system changes by malware or users without admin rights.

**Q3: How to disable UAC via registry?**
**A:** Set `EnableLUA` to `0` in `HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System`

**Q4: UAC setting to never notify?**
**A:** Lowest level in UAC slider.

**Q5: Command to force run a program as administrator?**
**A:** Right-click > Run as Administrator

**Q6: What's the command to open Control Panel directly?**
**A:** `control`

**Q7: What happens when UAC is triggered?**
**A:** A prompt appears for admin approval before proceeding.

**Q8: Which tool audits UAC events?**
**A:** `Event Viewer > Security Logs`

**Q9: Does UAC block unsigned apps?**
**A:** It prompts, but does not automatically block.

**Q10: Can UAC be bypassed?**
**A:** Yes, but it requires exploiting misconfigurations or vulnerabilities.

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## ☑ *Task 8: Settings and the Control Panel*

*Definition*:

> ***Settings and Control Panel*** are interfaces to manage system settings such as accounts, network, devices, and updates.

🗄 *Practice Questions & Answers:*

**Q1: How to open Control Panel?**
**A:** Run `control` or search in Start.

**Q2: Command to open Device Manager from CMD?**
**A:** `devmgmt.msc`

**Q3: What is the difference between Control Panel and Settings?**
**A:** Control Panel is legacy; Settings is the modern interface introduced in Windows 10.

**Q4: How to open Network settings?**

**A:** `Start > Settings > Network & Internet` or `ncpa.cpl`

**Q5: Command to open Programs and Features?**

**A:** `appwiz.cpl`

**Q6: How to change display resolution?**

**A:** `Settings > Display > Resolution`

**Q7: Command to open System Properties window?**

**A:** `sysdm.cpl`

**Q8: Command to access power settings?**

**A:** `powercfg.cpl`

**Q9: How to check installed updates via GUI?**

**A:** `Settings > Windows Update > Update history`

**Q10: Tool to uninstall system apps?**

**A:** `Control Panel > Programs and Features` or use PowerShell for advanced removal.

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## ☑ *Task 9: Task Manager*

***Definition*:**

> ***Task Manager*** is a tool to monitor running processes, system performance, app history, and startup programs.

### 🗄 *Practice Questions & Answers:**

**Q1: Shortcut to open Task Manager?**
**A:** `Ctrl + Shift + Esc`

**Q2: Command to launch Task Manager from Run?**
**A:** `taskmgr`

**Q3: How to kill a process using Task Manager?**
**A:** Right-click > End Task

**Q4: How to view CPU and RAM usage?**
**A:** Use the "Performance" tab in Task Manager.

**Q5: Command-line way to kill a process?**
**A:** `taskkill /IM notepad.exe /F`

**Q6: What is the purpose of the Startup tab?**
**A:** Manage apps that run at Windows startup.

**Q7: How to run a new task from Task Manager?**
**A:** File > Run new task

**Q8: What's the difference between a process and a service?**

**A:** A process is a running instance of an app; services run in background with no UI.

**Q9: Can Task Manager monitor GPU usage?**

**A:** Yes, in the Performance tab (Windows 10+).

**Q10: How to access services from Task Manager?**

**A:** Services tab > Right-click > Go to Services

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# 📝 *Windows Fundamentals 2 – Tasks 1 to 8 (Complete Lab)*

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## ☑ *Task 1: Introduction*

*Definition*:

> *Windows Fundamentals 2* `focuses` on system configuration, management tools, and administrative tasks.

- It builds foundational knowledge for managing Windows at a deeper level.

🗄 *Practice Questions & Answers:*

**Q1: What does Windows Fundamentals 2 cover?**

**A:** System configuration, resource monitoring, command-line tools, and administrative utilities.

**Q2: Name one important GUI tool for system management.**

**A:** Computer Management (`compmgmt.msc`)

**Q3: Which Windows feature monitors system performance in real time?**

**A:** Resource Monitor

**Q4: How to open the Command Prompt as administrator?**

**A:** Right-click CMD > "Run as administrator"

**Q5: What is System Configuration used for?**

**A:** Managing startup items, services, boot options, and tools.

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## ☑ *Task 2: System Configuration*

*Definition*:

> *System Configuration* (`msconfig`) is a tool used to troubleshoot and manage startup settings, services, and system behavior.

🗄 *Practice Questions & Answers:*

**Q1: How to open System Configuration?**

**A:** Run `msconfig`

**Q2: Which tab controls startup items in `msconfig`?**

**A:** `Startup` tab (redirects to Task Manager in modern versions)

**Q3: What is Safe Boot in Boot tab?**

**A:** Minimal startup environment for troubleshooting.

**Q4: How do you enable diagnostic startup?**

**A:** In `General` tab, select "Diagnostic startup"

**Q5: Which tab gives access to advanced tools?**

**A:** `Tools` tab

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## ☑ *Task 3: Change UAC Settings*

***Definition*:**

> ***User Account Control*** settings determine when W*indows prompts the user for elevation of privileges.*

🗄 *Practice Questions & Answers:*

**Q1: Command to open UAC settings?**

**A:** `UserAccountControlSettings.exe`

**Q2: How many UAC levels are available?**

**A:** Four levels ranging from "Always notify" to "Never notify"

**Q3: Can standard users change UAC settings?**

**A:** No, admin privileges are required.

**Q4: Which registry key stores UAC config?**

**A:** `HKLM\Software\Microsoft\Windows\CurrentVersion\Policies\System`

**Q5: What does UAC protect against?**

**A:** Unauthorized changes by users or software.

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## ☑ *Task 4: Computer Management*

***Definition*:**

> ***Computer Management*** combines several *administrative tools like Disk Management, Event Viewer, Services, and Device Manager.*

🗄 *Practice Questions & Answers:*

**Q1: Command to open Computer Management?**

**A:** `compmgmt.msc`

**Q2: How to view disk partitions?**

**A:** Use Disk Management inside Computer Management.

**Q3: Which tool shows system logs and errors?**

**A:** Event Viewer

**Q4: How to manage services using GUI?**

**A:** `services.msc`

**Q5: How to disable a hardware device?**

**A:** Via Device Manager > Right-click device > Disable

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## ☑ *Task 5: System Information*

***Definition*:**

> **System Information** (`msinfo32`) provides a detailed *overview of the hardware, drivers, and software environment of the system.*

### 🖥 *Practice Questions & Answers:*

**Q1: How to open System Information tool?**

**A:** `msinfo32`

**Q2: Which section lists installed drivers?**

**A:** "Software Environment > System Drivers"

**Q3: Can you export system info?**

**A:** Yes, File > Export

**Q4: What tab shows BIOS version?**

**A:** System Summary

**Q5: How to find total RAM installed?**

**A:** Under System Summary > Installed Physical Memory

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## ☑ *Task 6: Resource Monitor*

***Definition*:**

> **Resource Monitor** (`resmon`) is used to *monitor CPU, memory, disk, and network usage in real-time.*

### 🖥 *Practice Questions & Answers:*

**Q1: How to launch Resource Monitor?**

**A:** Run `resmon` or open via Task Manager > Performance tab > Open Resource Monitor

**Q2: What graphs does it show?**

**A:** CPU, Memory, Disk, Network usage

**Q3: Can you end processes in Resource Monitor?**

**A:** Yes, right-click > End Process

**Q4: How to analyze disk activity?**

**A:** Use Disk tab in Resource Monitor

**Q5: What does "Hard Faults/sec" indicate?**

**A:** Virtual memory usage due to insufficient RAM

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## ☑ *Task 7: Command Prompt*

***Definition*:**

> **Command Prompt** (`cmd.exe`) is a *command-line interface* used to execute system commands and scripts.

### 🖳 *Practice Questions & Answers:*

**Q1: How to open CMD as administrator?**

**A:** Right-click on CMD > Run as administrator

**Q2: Command to list all files in a directory?**

**A:** `dir`

**Q3: Command to check system IP?**

**A:** `ipconfig`

**Q4: Command to list running processes?**

**A:** `tasklist`

**Q5: Command to shut down PC immediately?**

**A:** `shutdown /s /t 0`

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## ☑ *Task 8: Registry Editor*

***Definition*:**

> **Registry Editor** (`regedit`) is a *tool to view and edit the Windows registry.*

- A hierarchical database that stores system and user configurations.

### 🖳 *Practice Questions & Answers:*

**Q1: How to launch Registry Editor?**

**A:** Run `regedit`

**Q2: What key stores startup programs?**

**A:** `HKCU\Software\Microsoft\Windows\CurrentVersion\Run`

**Q3: How to back up a registry key?**

**A:** Right-click key > Export

**Q4: Can editing the registry harm the system?**

**A:** Yes, incorrect edits can cause instability or failure.

**Q5: Which key contains system policies?**

**A:** `HKLM\Software\Policies`

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# 📝 *Windows Fundamentals 3 – Tasks 1 to 9 (Complete Lab)*

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## ☑ *Task 1: Introduction*

*Definition*:

> **Windows Fundamentals 3** focuses on *security features* such as antivirus, firewall, BitLocker, device protection, and backup systems.

🗄 *Practice Questions & Answers:*

**Q1: What does Windows Security offer?**
**A:** Antivirus, firewall, device protection, and app control.

**Q2: What is BitLocker?**
**A:** A disk encryption feature to protect data on drives.

**Q3: How to access Windows Security Center?**
**A:** `Settings > Update & Security > Windows Security`

**Q4: What is VSS used for?**
**A:** Volume Shadow Copy Service is used to create backup snapshots.

**Q5: Can you enable firewall per network type?**
**A:** Yes – Private, Public, and Domain profiles.

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## ☑ *Task 2: Windows Updates*

*Definition*:

> **Windows Update** is responsible for keeping the *system secure and up-to-date* with patches, drivers, and feature updates.

🗄 *Practice Questions & Answers:*

**Q1: How to manually check for updates?**
**A:** `Settings > Update & Security > Windows Update`

**Q2: Command to check updates via CMD?**
**A:** `wuauclt /detectnow`

**Q3: How to view update history?**
**A:** `Settings > Update History`

**Q4: Can updates be paused?**
**A:** Yes, from the Update settings.

**Q5: How to roll back a Windows update?**

**A:** `Settings > Recovery > Go back to previous version`

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## ☑ *Task 3: Windows Security*

*Definition*:

> **Windows Security** is the *built-in antivirus* and threat protection suite in Windows that monitors viruses, ransomware, and other malware threats in real-time.

### 🗄 *Practice Questions & Answers:*

**Q1: How do you open Windows Security?**
**A:** Go to `Settings > Privacy & Security > Windows Security` or run `windowsdefender:` in the Run dialog.

**Q2: What areas are protected by Windows Security?**
**A:** Virus & threat protection, firewall, app control, device security, and more.

**Q3: Can you perform a quick scan from Windows Security?**
**A:** Yes, under "Virus & Threat Protection" > Quick scan.

**Q4: What is Real-time Protection?**
**A:** It actively scans files and programs as they are accessed.

**Q5: Where can you manage notifications?**
**A:** Inside Windows Security settings under Notification preferences.

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## ☑ *Task 4: Virus & Threat Protection*

*Definition*:

> This section of **Windows Security** *focuses on scanning, quarantining, and removing malicious threats from the system*.

### 🗄 *Practice Questions & Answers:*

**Q1: What scan types are available?**
**A:** Quick, Full, Custom, and Microsoft Defender Offline scan.

**Q2: What happens to quarantined files?**
**A:** They are isolated from the system and can be reviewed or deleted later.

**Q3: How to view scan history?**
**A:** Go to Virus & threat protection > Protection history.

**Q4: What is Microsoft Defender Offline scan?**
**A:** A deep scan that runs before Windows boots.

**Q5: Command-line version of Defender scan?**
**A:** `MpCmdRun.exe -Scan -ScanType 1`

## ☑ *Task 5: Firewall & Network Protection*

*Definition*:

> The *Windows Firewall* helps prevent unauthorized access to or from a private or public network.

🗄 *Practice Questions & Answers:*

**Q1: How to access firewall settings?**
**A:** Go to Windows Security > Firewall & network protection

**Q2: What types of network profiles are available?**
**A:** Domain, Private, and Public

**Q3: How to allow an app through the firewall?**
**A:** Firewall & Network Protection > Allow an app through firewall

**Q4: How to disable firewall for a specific network type?**
**A:** Select the network type and turn off Microsoft Defender Firewall.

**Q5: What is the command to reset firewall settings?**
**A:** `netsh advfirewall reset`

## ☑ *Task 6: App & Browser Control*

*Definition*:

> This feature *manages app* reputation-based protection and SmartScreen settings for safer browsing and app usage.

🗄 *Practice Questions & Answers:*

**Q1: What is Microsoft Defender SmartScreen?**
**A:** It helps protect your device by warning about malicious websites and downloads.

**Q2: Where can you manage app reputation settings?**
**A:** App & browser control > Reputation-based protection

**Q3: Can you block potentially unwanted apps (PUAs)?**
**A:** Yes, via Reputation-based protection settings.

**Q4: What does Exploit protection do?**
**A:** Helps guard against malware attacks through system vulnerabilities.

**Q5: How to disable SmartScreen temporarily?**
**A:** App & browser control > Turn off all toggles under SmartScreen

## ☑ *Task 7: Device Security*

*Definition*:

> **Device security** provides *hardware-level security features* like Core Isolation and Secure Boot to protect the OS from rootkits and unauthorized access.

🖳 ***Practice Questions & Answers:***

**Q1: What is Core Isolation?**

**A:** A virtualization-based security feature that isolates critical parts of the OS.

**Q2: What is Secure Boot?**

**A:** Ensures the system boots only with software trusted by the OEM.

**Q3: How to check if Core Isolation is enabled?**

**A:** Go to Windows Security > Device Security > Core Isolation Details

**Q4: What does TPM do?**

**A:** Trusted Platform Module stores cryptographic keys and ensures integrity.

**Q5: How to check TPM availability?**

**A:** Run `tpm.msc`

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## ☑ *Task 8: BitLocker*

***Definition*:**

> **BitLocker** is a *drive encryption feature* that helps protect data by encrypting entire volumes.

🖳 ***Practice Questions & Answers:***

**Q1: How to enable BitLocker?**

**A:** Control Panel > BitLocker Drive Encryption

**Q2: Which Windows editions support BitLocker?**

**A:** Windows Pro, Enterprise, and Education

**Q3: How to back up your BitLocker recovery key?**

**A:** During setup or via Control Panel > Save to file/USB/Account

**Q4: Command-line to manage BitLocker?**

**A:** `manage-bde`

**Q5: How to check BitLocker status?**

**A:** `manage-bde -status`

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## ☑ *Task 9: Volume Shadow Copy Service (VSS)*

***Definition*:**

> **VSS** enables taking *backup snapshots* of system or user data even while the system is running.

🖳 ***Practice Questions & Answers:***

**Q1: What is the primary use of VSS?**

**A:** To create system restore points and backups without disrupting operations.

**Q2: What tool uses VSS to create restore points?**

**A:** System Restore and Backup utilities

**Q3: How to open System Restore settings?**

**A:** Control Panel > Recovery > Configure System Restore

**Q4: What is the command to create a restore point?**

**A:** Use `wmic.exe` or PowerShell commands for scripting restore points.

**Q5: What happens if VSS fails during backup?**

**A:** The backup may fail or be incomplete.