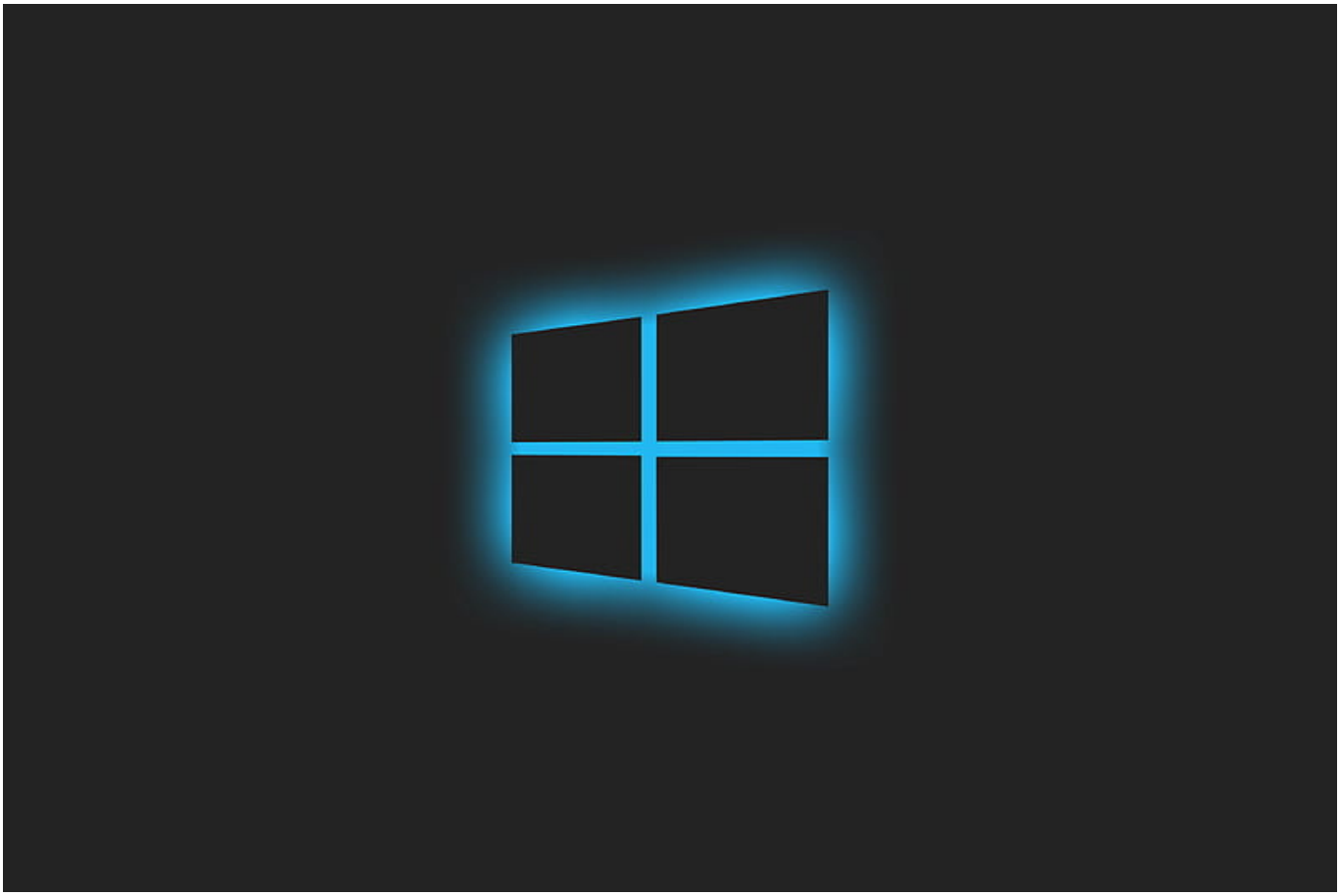

💻 *Windows Fundamentals – Complete Notes & Lab (Definitions & Practice)*

> ***Descripton:***
>
> - *Comprehensive definitions, practice questions, and step-by-step **labs for mastering Windows** security, administration, and system management.*

- ***Windows Fundamentals 1 – Tasks 1 to 9***
- ***Window Fundamentals 2 - Tasks 1 to 8***
- ***Windows Fundamentals 3 - Tasks 1 to 9***

> ***Instructor:***

- ***Syed Ramzan Bukhari***

> ***YouTube Channel:***

- ***The House of Hackers***

> ***Learning Source:***

- ***TryHackMe***

📝 *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)

✅ *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`

✅ *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"

✅ *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`

✅ *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.

✅ *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.

✅ *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.

✅ *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

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

✅ *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.

✅ *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

✅ *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.

✅ *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

✅ *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

✅ *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

✅ *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`

✅ *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`

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

✅ *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.

✅ *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`

✅ *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.

✅ *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

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✅ *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`

✅ *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`

✅ *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.