Question 01

Device Name	Specification Name	Actual specifications of the device	Description
1. Apple iPad 10.2'' (9th generation)	Display	▪ 10.2 inches (Size) ▪ IPS (Type) ▪ 2160 × 1620 pixels (Resolution)	• IPS is one of the most advanced display panels. These display panels are more durable, have wider viewing angles, and produce colors that are truer to life
	Dimensions	250.6 × 174.1 × 7.5 mm	Height × Width × Thickness
	Processor	A13 Bionic chip with 64 bit architecture and embedded motion co-processor	• Hexa-core (2x2.65 GHz Lightning + 4x1.8 GHz Thunder) ❖ While one core is working on one task, another core can work on a different task. Therefore, a CPU's efficiency increases with the number of cores it has. • CPU frequency is 2650 MHz which describes the processor's clock rate in cycles per second. • The computer processor will be able to process information more quickly with a higher number of cycles per second.
	Operating System	iPad OS 15	• An operating system is the core software (system software) that handles all of a computer's hardware and other software

	RAM	▪ 3 GB (Size) ▪ LPDDR4X SDRAM (Type)	• Low Power Double Data Rate 4X Synchronous Dynamic Random-Access Memory, is a common memory type found in mobile devices such as smartphones and tablets. • This type of RAM is designed to provide memory access with high bandwidth while consuming the least amount of power, thereby extending battery life. ❖ The RAM gives the device the memory it needs to execute multiple applications at once.
	Cache Memory	▪ L1 128 KB + 128 KB ▪ L2 8192 KB	❖ The cache memory improves processing speed by temporarily storing frequently used data and lowering latency.
	Secondary storage (depends on the model)	<u>Internal Storage</u> Capacity: 64 GB/ 256GB	• Lacks an internal memory card slot for additional storage ❖ Secondary storage is where we store our files which are non-volatile
➢ As a mobile device, when it comes to performance, the A13 Bionic chip is made to be energy-efficient. For most essential of tasks, the 3GB RAM is sufficient and helps save energy. The device remains lightweight and portable due to the lack of external storage choices			
2. Apple iPad Pro 11" (2022)	Display	▪ 11 inches (Size) ▪ IPS (Type) ▪ 2388 × 1668 pixels (Resolution)	• In-Plane Switching is one of the most advanced display panels which is commonly used on mobile devices nowadays. • These display panels build colors that are closer to life, are less fragile, and offer wider viewing angles.
	Dimensions	247.6 x 178.5 x 5.9 mm	Height × Width × Thickness

	Processor	Apple M2	• Octa-core has four high-performance "Avalanche" cores and four energy-efficient "Blizzard" cores. ❖ With more cores, execution is sped. • The clock frequency is 3.50 GHz ❖ The amount of cycles a CPU completes each second is indicated by its frequency. The ability of the processor to accomplish tasks more quickly increases with the number of cycles
	Operating System	iPadOS 16.1	• Upgradable to iPadOS 16.4.1 ❖ The primary program (system software) that manages all of a computer's hardware and other software is called an operating system.
	RAM	▪ 8 GB or 16GB (Size) ▪ LPDDR4X (Type)	• This type of RAM is designed to provide memory access with high bandwidth while consuming the least amount of power, thereby extending battery life. ❖ The RAM gives the device the memory it needs to execute multiple applications at once.
	Cache Memory	▪ High performance cores: ★ L1 192 KB instruction cache + 128 KB data cache, L2 16 MB ▪ Energy-efficient cores: ★ L1 128 KB instruction cache + 64 KB data cache	❖ The computer's processor can quickly retrieve data from cache memory, which holds data/ instruction temporarily

	Secondary Storage	<u>Internal Storage</u> Capacity: 128 GB/ 256 GB/ 512 GB/ 1024 GB/ 2048 GB	• Lacks an internal memory card slot for extra storage ❖ Secondary storage is where we store our files which are non-volatile
➢ For those who prefer a larger screen size than what a standard smartphone can provide, the Apple iPad Pro 11" (2022) can be an excellent mobile device. It can perform a variety of functions, like playing games, editing films, and online browsing, thanks to its powerful M1 CPU.			
3. Microsoft Surface Pro 9	Display	▪ 13 inches (Size) ▪ IPS LCD (Type) ▪ 2880 X 1920 pixels (Resolution)	• IPS has faster response times. Has wider viewing angles and also has better color/contrast
	Dimensions	209 × 287 × 9.3 mm	Width × Height × Thickness
	Processor	12th Gen Intel® Core™ i5-1235U processor/ 12th Gen Intel® Core™ i7-1255U processor	• Both types of processors have 10 cores. ❖ One task can be divided into parts and execute at the same time. Each part will be taken care by one core. So more cores we have, we can quickly execute programs. • Each type of processor has a CPU frequency of up to 4.40 GHz and 4.70 GHz, respectively. ❖ The CPU can do tasks more quickly if it has a higher cycle count.
	Operating System	Windows 11 Home	❖ Operating system is the main program (system software) that controls all of a computer's hardware and other programs

	RAM	▪ 8GB/ 16GB/ 32GB (Sizes) ▪ LPDDR5 RAM (Type)	❖ The RAM gives the device the memory it needs to execute multiple applications at once. • LPDDR5 saves power more than LPDDR4X. Also 1.5 times faster than previous versions as well
	Cache Memory	L3 12MB	❖ Data and instructions that are frequently requested are stored in cache memory so that the CPU can access them without delay when needed.
	Secondary Storage	<u>Internal Storage</u> Capacity: 128 GB/ 256GB/ 512 GB/ 1 TB Type: SSD	❖ Secondary storage is where we store our files which are non-volatile • Does not have microSD card slot as the SSD is removable
➢ The Microsoft Surface Pro 9 can also be a great mobile device, especially for people who need the adaptability of a tablet and the power of a laptop in one device. It has a large and high-resolution screen, a detachable keyboard cover, and a stylus pen for note-taking and drawing. Also, this device runs on Windows 11, which means you can use full desktop applications. Additionally, the long lasting battery provides you to work on for more hours without charging.			
4. Samsung Galaxy Tab S8+	Display	12.4 inches (Size) Super AMOLED (Type) 1752 × 2800 pixels (Resolution)	• Super AMOLED is a display technology used in mobile devices as well as televisions. • Uses less power than a standard LCD panel, offers more vivid picture quality, and has a quicker motion response than other display technologies like LCD.
	Dimensions	285 × 185 × 5.7 mm	Height × Width × Thickness

	Processor	Qualcomm SM8450 snapdragon 8 Gen 1	Octa-core : Single core @ 3.00 GHz Triple core @ 2.50 GHz Quad core @ 1.80 GHz ❖ Having more cores and having higher number of CPU frequency helps us to get our executions done quickly
	Operating System	Android 12	• Upgradable to Android 13, One UI 5 • An operating system is the core software (system software) that handles all of a computer's hardware and other software
	RAM	8 GB/ 12 GB/ 16 GB (Size)	❖ Provides the device with the memory it needs to run several applications simultaneously
	Cache Memory	L2 1MB L3 6MB	• The computer's processor can quickly retrieve data from cache memory, which holds data/ instruction temporarily
	Secondary Storage	<u>Internal Storage</u> Capacity: 128 GB/ 256GB/ 512 GB MicroSD available	❖ Secondary storage is where we store our files which are non-volatile. • Expandable storage option up to 256 GB with MicroSD card.
➢ It is simple to carry due to its low weight and thinness. It also has a long battery life, so you can use it without charging for a number of hours. Also, this device features a strong processor and lots of storage, so it can handle a variety of tasks, from web browsing to editing pictures and movies. You can get a variety of apps through the Google Play Store because it also runs on the most recent version of Android.			

5. Apple iPad Mini 6	Display	8.3 inches (Size) Liquid Retina IPS LCD (Type) 1488 × 2266 pixels (Resolution)	• Liquid Retina is a display technology which is used by Apple. Because of its high pixel density, it provides a better visual experience.
	Dimensions	195.4 × 134.8 × 6.3 mm	Height × Width × Thickness
	Processor	Apple A15 Bionic chip	• Hexa-core (with 2 performance cores and 4 efficiency cores) with CPU clock rate which is 2.93 GHz ❖ More cores and faster CPU frequency allow us to complete our executions more quickly.
	Operating System	iPadOS 15, up to iPadOS 15.7	• Upgradable to iPadOS 16.4.1 ❖ An operating system is the core software (system software) that handles all of a computer's hardware and other software
	RAM	▪ 4GB (Size) ▪ LPDDR5 (Type)	• LPDDR5 saves power more than LPDDR4X. Also 1.5 times faster than previous versions as well ❖ Data is kept in RAM until the processor needs it.
	Cache Memory	L2 cache : ▪ 12 MB performance cores ▪ 4 MB efficient cores ▪ 32 MB system cache	❖ The computer's processor can quickly retrieve data from cache memory, which holds data/ instruction temporarily
	Secondary Storage	<u>Internal Storage</u> Capacity: 64 GB/ 256GB	❖ Secondary storage is where we store our files which are non-volatile • Lacks an internal memory card slot for extra storage
➢ This device is a small and portable tablet which can be easily carried around. It has a powerful A15 Bionic chip which is really useful for any kind of task. Even though it's small, it still has a high-resolution display with a screen that's ideal for viewing videos, reading books, or browsing the internet. It also has a long battery life, so you can use it without charging for a number of hours.			

6. Amazon Fire HD 10	Display	IPS LCD (Type) 10.1'' (Size) 1920 × 1200 pixels (Resolution)	• Brighter display - Vivid 10.1" 1080p Full HD display is 10% brighter than previous generation, with more than 2 million pixels
	Dimensions	247 × 166 × 9.2 mm	Height × Width × Thickness
	Processor	Mediatek MT8183 Helio P60T	• Octa core – has 8 cores in the processor ❖ Having more cores speed up the process of execution • CPU frequency - 2.0 GHz ❖ CPU frequency indicates the number of cycles a CPU perform per second. Having a higher number of cycles means that the processor is able to perform more quickly.
	Operating System	Android 9 (Pie), Fire OS 7	❖ Operating systems keep track of who is using which resource in order to ensure efficient and fair resource sharing between users and programs.
	RAM	3GB (Size)	❖ The RAM gives the device the memory it needs to execute multiple applications at once.
	Cache Memory	Not available	❖ The computer's processor can quickly retrieve data from cache memory, which holds data/ instruction temporarily
	Secondary Storage	Internal Storage Capacity: 32 GB/ 64GB microSD card available	• microSD card can be used up to 1 TB for extra storage ❖ Secondary storage is where we store our files which are non-volatile

➢ Suitable and cost-effective option for a tablet to use for everyday activities like browsing the web, reading books, and watching videos. It includes a wide 10-inch screen, a powerful battery, and Alexa voice assistant functionality. Additionally, the device has a microSD slot for expandable storage, allowing you to add more media files.			
7. Samsung Galaxy Tab A8	Display	TFT LCD (Type) 10.5'' (Size) 1200 × 1920 pixels (Resolution)	This type of display provides for increased response time, greater image quality, and lower power usage.
	Dimensions	246.8 × 161.9 × 6.9 mm	• Height × Width × Thickness
	Processor	Unisoc Tiger T618 (12nm)	• Octa-core processor with CPU frequency of 2 GHz ❖ More cores and a greater CPU frequency enable us to complete our executions faster.
	Operating System	Android 11	• Upgradable to Android 13, One UI 5 ❖ The operating system serves as a bridge between the hardware and its users, covering them from the complexity of the hardware resources.
	RAM	2GB/ 3GB/ 4GB (Size)	❖ The RAM offers the device with the memory it requires to run several apps at once.
	Cache Memory	L3 1 MB	❖ Cache memory is utilized to decrease the average access time required to retrieve data from the main memory.
	Secondary Storage	<u>Internal Storage</u> Capacity: 32 GB/ 64 GB/ 128 GB microSDXC [dedicated slot] available	❖ Secondary storage is where we store our files which are non-volatile • Supports to expand the storage up to 1 TB using the microSDXC card.
➢ Suitable for daily tasks like browsing, email checking, and video streaming. It's an excellent choice for those on a tight budget who don't want the advanced features of more expensive tablets. Additionally, it has a long-lasting battery as well.			

References

1. https://www.apple.com/ipad-10.2/

1. https://www.devicespecifications.com/en/model/2a5c574c

1. https://support.apple.com/en-us/HT212789#:~:text=iPadOS%2015%20makes%20multitasking%20easier,over%20any%20app%20or%20screen.

2. https://www.gsmarena.com/apple_ipad_pro_11_(2022)-11940.php

2. https://www.devicespecifications.com/en/model/c7075ae0

2. https://en.wikipedia.org/wiki/IPadOS_16

3. https://www.microsoft.com/en-us/d/surface-pro-9/93vkd8np4fvk?activetab=pivot:overviewtab

3. https://nanoreview.net/en/laptop/microsoft-surface-pro-9

3. https://www.micron.com/products/dram/lpddr5

3. https://www.xda-developers.com/surface-pro-9-micro-sdcard-slot/

3. https://www.intel.com/content/www/us/en/products/sku/226266/intel-core-i51235u-processor-12m-cache-up-to-4-40-ghz-with-ipu/specifications.html

3. https://www.intel.com/content/www/us/en/products/sku/226259/intel-core-i71255u-processor-12m-cache-up-to-4-70-ghz/specifications.html

4. https://www.samsung.com/levant/tablets/galaxy-tab-s/galaxy-tab-s8-plus-wifi-graphite-128gb-sm-x800nzaamea/

4. https://www.gsmarena.com/samsung_galaxy_tab_s8+-11342.php

4. https://www.sammobile.com/samsung/galaxy-tab-s8-plus/specs/

4. https://www.samsung.com/in/support/mobile-devices/what-is-the-difference-between-amoled-and-super-amoled/#:~:text=Super%20AMOLED%20is%20a%20more,screen%20in%20a%20single%20layer.&text=When%20compared%20with%20a%20regular,display%20technologies%20such%20as%20LCD.

4. https://nanoreview.net/en/soc/qualcomm-snapdragon-8-gen-1

4. https://www.samsung.com/levant/support/mobile-devices/galaxy-s8-s8-plus-what-is-the-accepted-external-memory-size-of-the-s8-s8-plus/#:~:text=Close-,%5BGalaxy%20S8%2FS8%2B%5D%20What%20is%20the%20accepted%20external%20memory,of%20the%20S8%2FS8%2B%3F&text=The%20device%20can%20accept%20external,up%20to%20(256%20GB)%3A

5. https://www.gsmarena.com/apple_ipad_mini_(2021)-11105.php

5. https://www.devicespecifications.com/en/model/0754574e

5. https://en.wikipedia.org/wiki/IPad_Mini_(6th_generation)#:~:text=Internally%2C%20it%20has%20an%20A15,the%20iPhone%20models'%203.23%20GHz.

6. https://www.amazon.com/Fire-HD-10-tablet/dp/B08BX7FV5L?th=1

6. https://www.gsmarena.com/amazon_fire_hd_10_(2021)-10881.php

7. https://www.gsmarena.com/samsung_galaxy_tab_a8_10_5_(2021)-11265.php

7. https://www.androidpolice.com/does-the-samsung-galaxy-tab-a8-support-sd-cards/

7. https://nauticomp.com/tft-lcd-displays-and-modules/#:~:text=While%20traditional%20LCDs%20use%20a,for%20use%20in%20portable%20devices.

7. https://www.notebookcheck.net/UNISOC-Tiger-T618-Processor-Benchmarks-and-Specs.512251.0.html