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ESP Homework (1)

Question 1

Part A

1. Motherboard: serves as the central circuit hub. It contains crucial hardware components. By connecting them to each other it allows communication between all the important parts.
   CPU (central processing unit): known as the brain of the computer; it is a microprocessor chip which processes data and manages the activities of all the other units.
   Memory modules: such as RAM or random-access memory which temporarily store data. Memory modules hold the instructions and data that are being processed by CPU.
   Storage devices: like HDDs, SSDs and optical drives. They are used to store information permanently.
   Input devices: they capture user's commands and data. Such as mouse, microphone and keyboard. They may act as eyes and ears of the PC.
   Output devices: they are used to extract the result. Examples are monitors and printers.
2. As mentioned in number 1 input devices are used to capture commands and data while output devices serve us to extract the results of our actions.
   Examples of input devices are webcams and microphones. They act as the eyes and ears of a PC.
   Examples of output devices are monitors and speakers. They serve as the display screens and audio interfaces through which the computer communicates results.
3. A GUI, or graphical user interface, is a type of interface that allows users to interact with electronic devices using graphical icons and visual indicators. With a GUI, we can use windows, icons, menus, and pointers instead of typing complex commands. It creates a user friendly environment and makes using computers easier and more accessible for everyone.
4. Because it ensures that learners can pronounce words and reproduce sounds correctly. By pronouncing professional terms accurately, we can communicate effectively and achieve high levels of professional language.

5. such as adjusting chair height, positioning monitors at eye level, and taking regular breaks.

Part B

A. operating systems (OS)
B. International Phonetic Alphabet (IPA)
C. solid-state drives (SSDs)
D. central processing unit (CPU)
E. Ergonomics

Part C

1. Motherboard
2. optical drives
3. grounding
4. icons

Part D

1. SSDs are smaller and faster than hard disk drives (HDDs).
2. It helps us lessen muscle fatigue and prevent repetitive strain injuries and eye strain by ensuring that our body is in a natural and comfortable position.

Question 2

A. In quantum computers, a qubit is the equivalent of a classical information bit and qubits can exist in superposition. Unlike classical bits, a qubit in superposition represents information that is not just zero or one, but something in parallel. If we imagine zero and one as two poles of a sphere, a qubit in superposition could be at any point on this sphere.
B. In response to laser inputs ions release photons. Photons emissions are determined by the qubit's quantum state. An imaging system collects these photons and processes them to reveal the output and read the state of the qubit.
C. Quantum state means the condition of the qubits in a quantum computer. This condition can exist in multiple states simultaneously because of an important property called superposition explained above.
D. Superconducting quantum computers differ from trapped ion quantum computers. Their circuits do calculations much faster than trapped ions and they are easier to scale up in numbers. However, they also have some

disadvantages: the circuits are more fragile and have a shorter lifespan compared to ions

E. Yes, I believe that we could transform the world once again with quantum computers as we have made many other advances through the history of computers and technology. Quantum computers have high potential to bring up revolution in many different fields such as cryptography and artificial intelligence. They also could be used to solve many global challenges. Of course there are some challenges and barriers in their path as mentioned in the video but in my opinion we would be able to overcome these problems and reshape the future of many science fields and industries.

Question 3

Part A

Self-driving cars are **vehicles** that do not require human drivers. **Advocates** of these cars say that they are safe because they **eliminate** the possibility of human error. They are also safe because they can quickly **adjust** to changing road conditions. Self-driving cars are good for **commuters** because they offer a more relaxing ride to work. On the other hand, there are also many possible disadvantages to self-driving cars. For one thing, they might actually result in more, not fewer, cars on the road, causing increased problems of traffic **congestion**. More traffic means more **emissions**, polluting our air if the cars are not electric. There are also many difficulties with technology that need to be worked out. It is hard to **predict** how self-driving cars will be used in the future.

Part B

1. c) Complete independence from human control under all conditions
2. c) Lower the number of vehicles on the road at a given time
3. b) Complicate or obstruct sensor functionality
4. c) Systems that foresee and respond to potential obstacles or events
5. c) Show a target group that could gain convenience and productivity