**What is ROM and what is its primary purpose?**

Read-Only Memory, ROM is a storage medium that is used with computers and other electronic devices.

**What is RAM and how is it different from ROM?**

Random Access Memory, Ram is a form of computer memory that can be read and changed in any order, typically used to store working data and machine code. ROM is a type of non-volatile memory used in computers and other electronic devices to store data for a long period.

**What is the difference between static RAM and dynamics RAM?**

Static RAM is fast and expensive, and dynamic RAM is less expensive and slower. Therefore, static RAM is used to create the CPU's speed-sensitive cache, while dynamic RAM forms the larger system RAM space.

**What type of memory is typically used in USB thumb drives? Why shouldn’t we rely on this for critical data storage?**

Drives typically use the USB mass storage device class to communicate with the host. Flash memory combines a number of older technologies, with lower cost, lower power consumption and small size made possible by advances in semiconductor device fabrication technology. The memory storage was based on earlier EPROM and EEPROM technologies. Here’s a look at why you shouldn’t rely on critical storage. Hardware Failure/Vulnerability: Critical hardware has a life expectancy like any other storage device out there, no matter the cost or solution all drives eventually die out and require you to upgrade or replace them.

**Consider a computer with 1GB RAM (1024 MB). Given memory addressing is for each byte, how many bits are needed to address all bytes in the system’s RAM?**

2^20. 8 589 934 592 bits that we need to address all bytes in system’s RAM.

Traditionally, von and access routes for instructions and data. Of course, there are several ways to arrange memory in between. Most contemporary processors, for example, have separate caches for instructions and data, but both caches are basically filtering requests to a single main memory that contains both instructions and data.

**What is cache memory and what is its primary role?**

The cache memory basically acts as a buffer between the main memory and the CPU. Moreover, it synchronizes with the speed of the CPU. Besides, it stores the data and instructions which the CPU uses more frequently so that it does not have to access the main memory again and again.

**Explain the concept of an interrupt, and list four common types.**

An interrupt is a signal from a device attached to a computer or from a program within the computer that requires the operating system to stop and figure out what to do next. Four common types of interrupts are Maskable Interrupt, non-maskable Interrupt, System Implementation & Exception. An interrupt is a signal generated by a device connected to a computer or by a program within the computer that causes the operating system to pause and determine what to do next.

**Polling is an alternative to interrupts? Briefly explain polling and why it is not commonly used**

Polling is an alternative approach to interrupts an alternative based on explicitly checking the state of devices/processes. It is not commonly used because it is generally considered as wasteful of CPU cycles.

**Explain the general concept of a stack - how do they work, and what is their primary purpose.**

A stack is a conceptual structure consisting of a set of homogeneous elements and is based on the principle of last in first out (LIFO). It is a commonly used abstract data type with two major operations, namely push and pop. Push and pop are carried out on the topmost element, which is the item most recently added to the stack.

**How are stacks useful for handling interrupts?**

The stack used is the interrupt stack for both the hardirq (hardware irq) and softirq (software irq). The stack remains consistent because the irq handler pushes all registers that could be used by a nested.

103799644 interrupt and maintains a nest counter. The TSS is used for irq going from ring 3 to ring 0 to switch the stacks.

+ Copy: The highest element in the stack is popped and then placed back into the stack twice, resulting in a duplicate of the original element. + Rotate: Also known as "roll," this parameter defines the number of items in a stack that are rotated in sequence. Rotating the top four components of a stack, for example, would shift the topmost element into the fourth place while the next three elements moved up one position.