# Question 1

A logical address is a virtual address generated by the CPU during the execution of the program. It’s a reference to a location in the memory which is the user can see. A physical address on the other hand is a location in the real memory unit in the computer. It is the actual location of the data or instruction that is being referenced by the logical address. Logical addresses are generated by the CPU and are translated into physical addresses.

# Question 2

A memory management unit (MMU) is a hardware component that translates logical addresses generated by the CPU into physical addresses that can be used to access memory.

# Question 3

Segmentation and paging are two different memory management techniques. Each with its own advantages and disadvantage. Segmentation allows for logical grouping of data, while paging allows for more efficient memory management. By combining segmentation and paging, the benefits of both techniques can be achieved.

# Question 4

External fragmentation

* Contiguous memory allocation could suffer from external fragmentation. This is because when a process is removed from memory, the space that it was using is left as a hole. If the hole is not large enough to be used by another process. This unused memory is called external fragmentation.
* Pure segmentation could suffer from external fragmentation. This is because when a segment is removed from memory, the space that it was using is left as a hole. If the hole is not large enough to be used by another segment, then this unused memory is called external fragmentation.
* Pure paging does not suffer from external fragmentation. This is because pages are of fixed size, so when a page is removed from memory, the space that it was using is immediately available to be allocated to another page.

Internal fragmentation

* Contiguous memory allocation could suffer from internal fragmentation. This is because the amount of memory that is allocated to a process may be larger than the amount of memory that the process uses. The unused memory is called internal fragmentation.
* Pure segmentation does not suffer from internal fragmentation. This is because segments are allocated in units of the segment size, so there is no unused memory.
* Pure paging can suffer from internal fragmentation. This is because pages are of fixed size, so when a page is allocated to a process, the process may not be able to use all the memory in the page. The unused memory is called internal fragmentation.

# Question 5

* Internal fragmentation occurs when a memory allocation unit is larger than the amount of memory that is needed by the process that is allocated the unit, while external fragmentation occurs when there are holes in memory that are too small to be used by any process.
* Internal fragmentation occurs within a memory allocation unit, while external fragmentation occurs between memory allocation units.
* Internal fragmentation can be reduced by using variable-sized memory allocation units, while external fragmentation can be reduced by compaction.