الجامعة الاسلامية العالمية ماليزيا
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Garden of Knowledge and Virtue

COMPUTER ARCHITECTURE & ASSEMBLY LANGUAGE

Course: CSC-3402, **Sec:** 02

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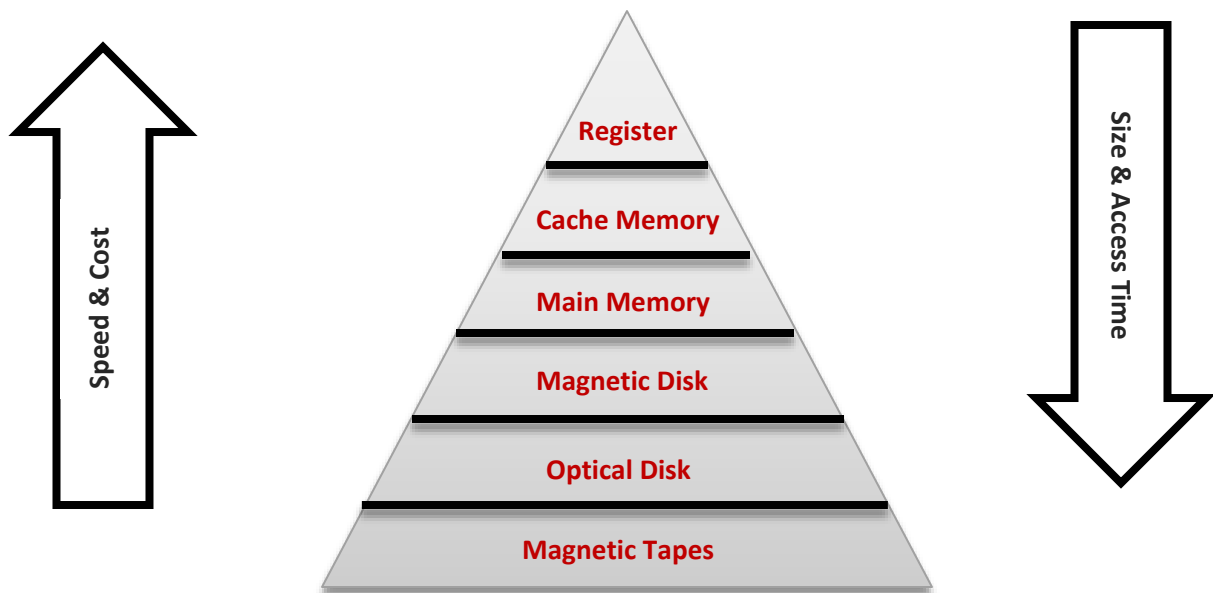
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1. Draw a memory hierarchy diagram.

Ans:

Memory Hierarchy is basically the divisions of a memory according to the performance and uses. The processor can be divided according to its requirements. There are six hierarchies in the memory. Which are **Register, Cache, Main Memory, Magnetic Discs, Optical Disk, Magnetic Tapes.** Below is the diagram for Memory Hierarchy:

Speed & Cost

Register

Cache Memory

Main Memory

Magnetic Disk

Optical Disk

Magnetic Tapes

Size & Access Time

2. Describe the different types of memory in the memory hierarchy in terms of performance, access time and cost.

Ans:

Registers: Registers are basically a static RAM or SRAM in the processor of the computer which is used for holding the data word which is typically 64 or 128 bits. Registers are the smallest and fastest memory in a computer.

Cache Memory: Cache memory can be located in the processor, but it's also possible in another IC. Cache Memory usually divided into levels. The cache stores chunks of data that are regularly

accessed from main memory. Cache memory is extremely fast memory type that acts a buffer between RAM and the CPU. (L1, L2, L3 Cache)

Main Memory: It is the main storage unit of the computer where **CPU** communicate directly. It refers to physical memory internal of the computer such as RAM, ROM. This memory is both fast and massive, and it is used to store data during the operations of a computer.

Magnetic Disk: A magnetic disk is a storage device which used a magnetization process to write, rewrite and access data. It has a magnetic coating on top and stores information in the form of tracks, spots, and sectors. Hard disk is considered as magnetic disk. Fast access and retrieval times compared to other storage devices.

Optical Disk: An optical disc is a computer disc that reads and writes data using optical storage techniques and technology. Auxiliary memory that accesses data faster. The performance of this disk is faster but not as faster than register. The cost of this disk is affordable.