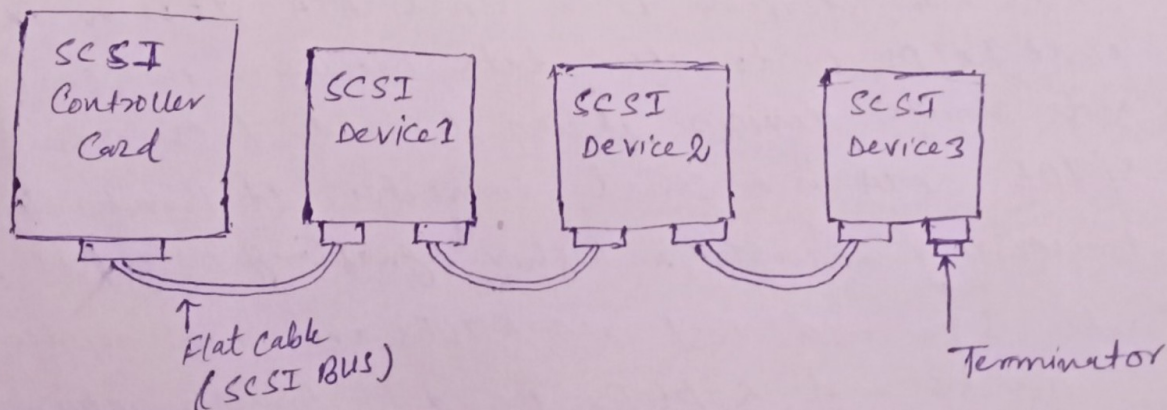
Hard Disk Controller

Magnetic disk drive requires controller. It convert instructions from software running on the computer to the electrical signals required to operate the hard disk. The function of a disk controller is disk disk drive selection, track and sector selection, to issue command to the drive system to perform read/write operation, serial to parallel and parallel to serial conversion of data etc.

SCSI and IDE :-

There are two types of hard disk controller: IDE (Integrated Drive Electronics) and SCSI (Small Computer System Interface). Actually then are not controllers, rather they are adapters. But generally people called a SCSI or IDE adapter a controllers.

SCSI (Small Computer System Interface) :- SCSI is an intelligent adapter. It contains separate I/O bus. It can connect up to 15 I/O devices such as hard disk, floppy disks, Printers, Scanners etc. It is a costly system. It is used with Large computers, servers etc. Ultra 320 and Ultra 160 SCSI have data transfer rates 320 and 160 MB/s respectively. Fig. below shows SCSI interface.



SCSI termination is the process of preventing the reflection of electrical signals from the ends of SCSI buses in order to ensure reliable operation.

IDE :-

IDE stands for "Integrated Drive Electronics". It is also known as parallel "ATA"; (ATA stands for Advanced Technology Attachment). It is an interface between a a computer bus and disk storage drives. IDE is a parallel connector. Moreover, it requires all the parallel signals to arrive at once. Therefore, IDE doesnot provide a high speed of data transferring. IDE is used for small size of disk drive unit.

EIDE (Enhanced IDE) :-

The enhanced IDE allows up to 4 channels. Each channel can interface up to 2 devices. Thus, total of up to 8 devices can be interfaced. EIDE, which is almost universal on new PCs, can interface optical disk, hard disk, floppy disk and magnetic tapes. Recently Seagate has developed Ultra ATA interface technology having data transfer rate of 33.3 Mbyte/sec.

SATA :-

SATA stands for "Serial Advanced Technology Attachment". It is also referred to as Serial ATA. It is an interface that helps to transfer data between the computer's bus and storage devices. It was designed to overcome the limitations of IDE. SATA is a serial connector. It provides faster data transferring through a higher signalling rates. It also reduces cable size and cost. Most IDEs are now replaced by SATA in desktops and laptops. The data transfer rates for the different versions of SATA are 150 MB/s, 300 MB/s, 1.5 GB/s, 3 GB/s etc. Being a serial interface, SATA uses thinner cables.

eSATA :-

eSATA is External SATA (External Serial Advanced Technology Attachment). It allows users to connect high capacity hard disk ~~drive~~ drive designed for eSATA interfacing, to the computer system through external ports without needing to open the cabinet. Recent motherboards Provide eSATA interface facility.

RAID SYSTEM :-

RAID stands for "Redundant Arrays of Independent Disks". RAID System is a set of disk drives. It is viewed by the operating system as a single Logical drive. These disk drives operates in parallel. It improves the storage reliability as the same information can also be stored on additional disk unit. It eliminates the risk of data Loss when one of the multiple unit fails. Further, a Large file can be stored in several disk units by splitting the file into a number of smaller Pieces and storing these Pieces on different disk units. This is known as "data Stripping". When file is accessed for read operation, all disk units send data in parallel, resulting in less time for file transfer.