OS TERM PAPER

TOPIC - DISK STRUCTURE

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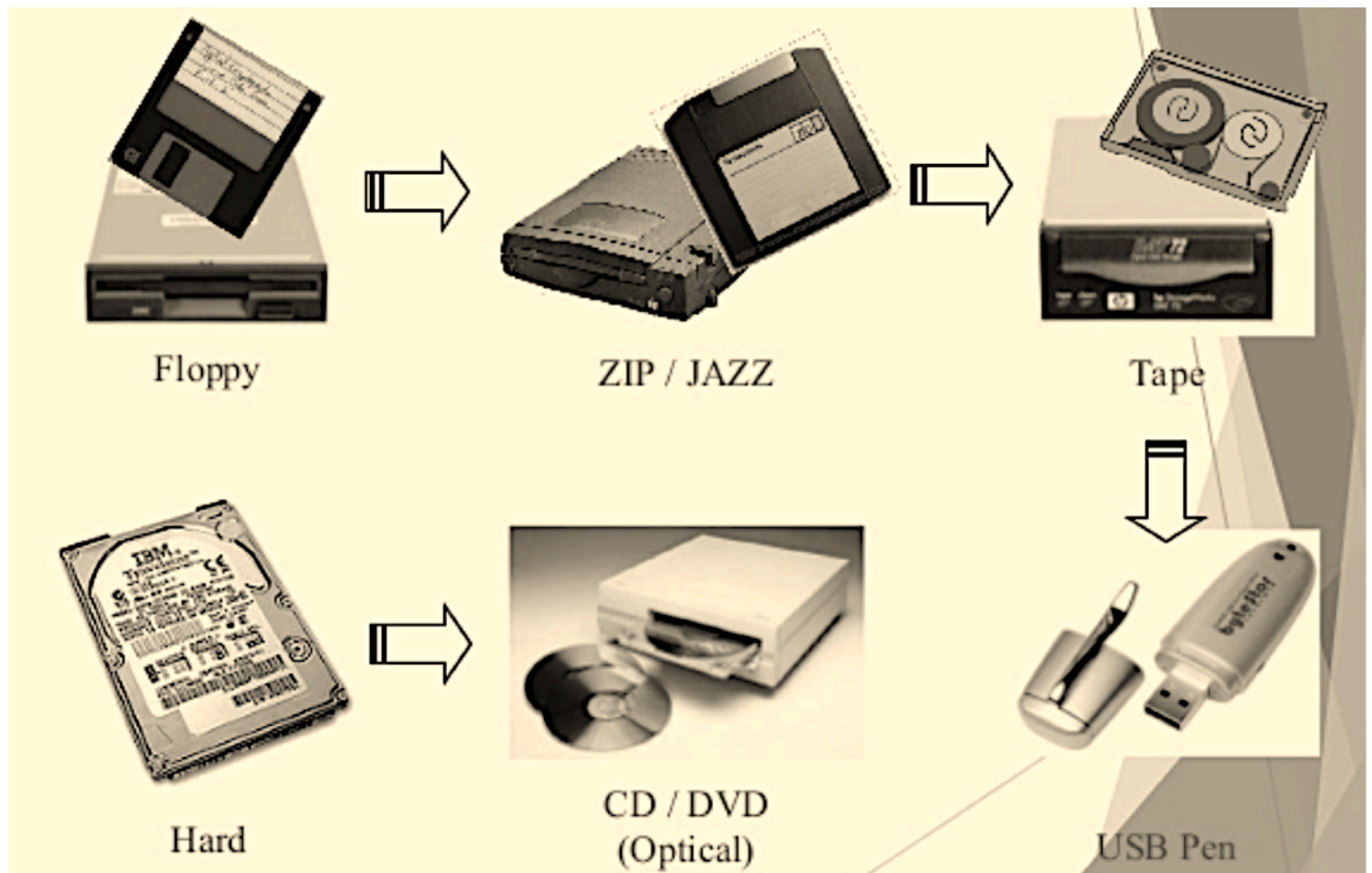**SEMESTER - 5TH**

<u>DISK</u>

Disk is a secondary storage device that is used to store data.

Disks provide a means to store a large amount of information for modern computer.
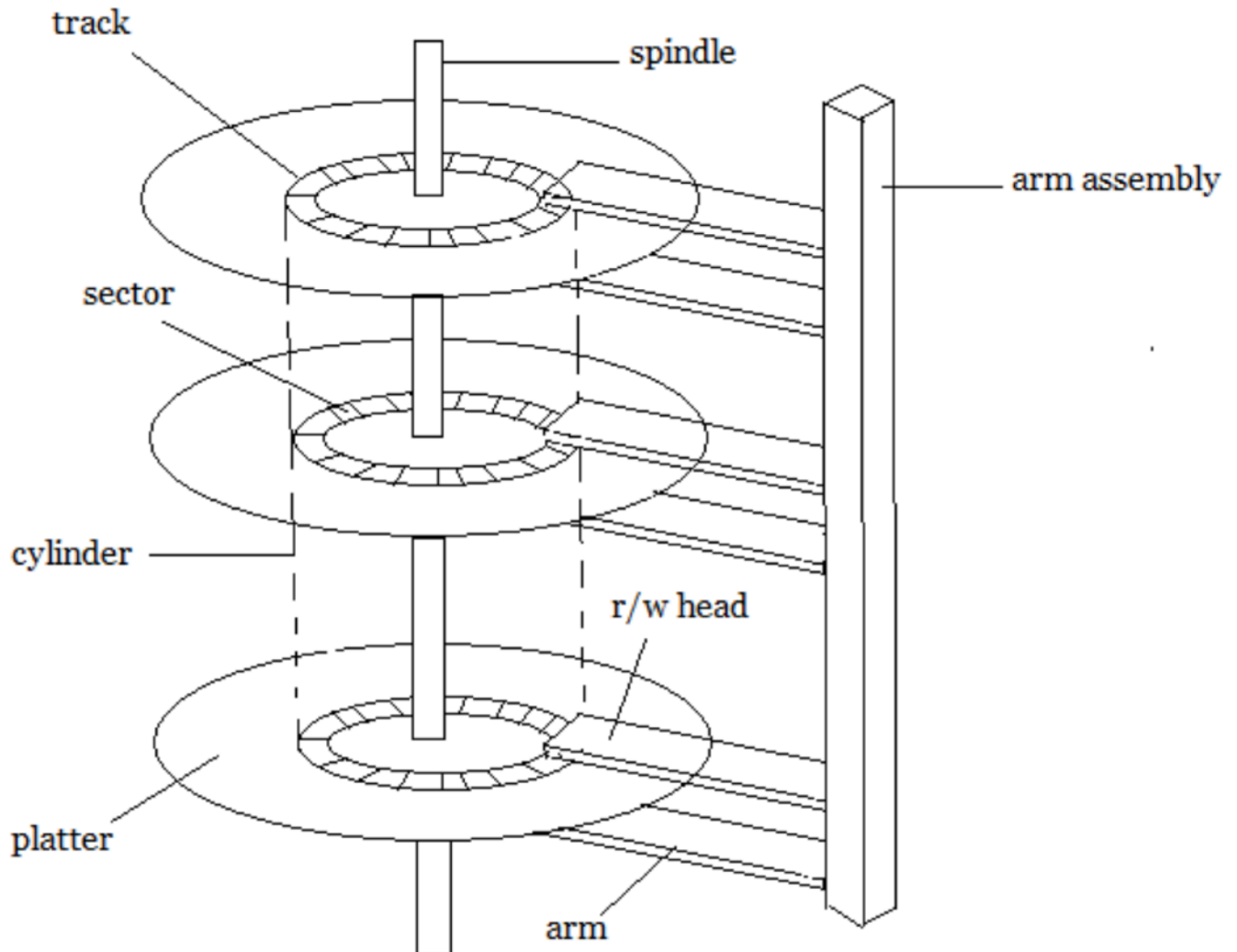
 Examples include: Hard Disk ,Floppy Disk

In modern computers, most of the secondary storage is in the form of magnetic disks. Hence, knowing the structure of a magnetic disk is necessary to understand how the data in the disk is accessed by the computer.

STORAGE TECHNOLOGIES

Floppy

ZIP / JAZZ

Tape

Hard

CD / DVD
(Optical)

USB Pen

DISK STRUCTURE

track

spindle

arm assembly

sector

cylinder

r/w head

platter

arm

A Disk is usually divided into TRACKS,CYLINDERS AND SECTORS. Hard disks drives are organized as a concentric stack of disks or 'platters'. Each platter has 2 surfaces and two read/write heads for each surface. Each platter has the same No. of tracks.

Platter is made from aluminum, ceramic, or class, coated with a magnetic materials such as iron oxide.

Each platter is divided into circular shaped **tracks**. The length of the tracks near the centre is less than the length of the tracks farther from the centre. Each track is further divided into **sectors**, as shown in the figure.
Tracks of the same distance from centre form a cylinder. A read-write head is used to read data from a sector of the magnetic disk.

The speed of the disk is measured as two parts:
  • **Transfer rate:** This is the rate at which the data moves from disk to the computer.
  • **Random access time:** It is the sum of the seek time and rotational latency.
Seek time is the time taken by the arm to move to the required track. **Rotational latency** is defined as the time taken by the arm to reach the required sector in the track.
Even though the disk is arranged as sectors and tracks physically, the data is logically arranged and addressed as an array of blocks of fixed size. The size of a block can be **512** or **1024** bytes. Each logical block is mapped with a sector on the disk, sequentially. In this way, each sector in the disk will have a logical address.

Exploded View of a Hard Drive

PLATTER

READ/WRITE
HEAD

SPINDLE

ACTUATOR

HOUSING

POWER
CONNECTOR

PCB
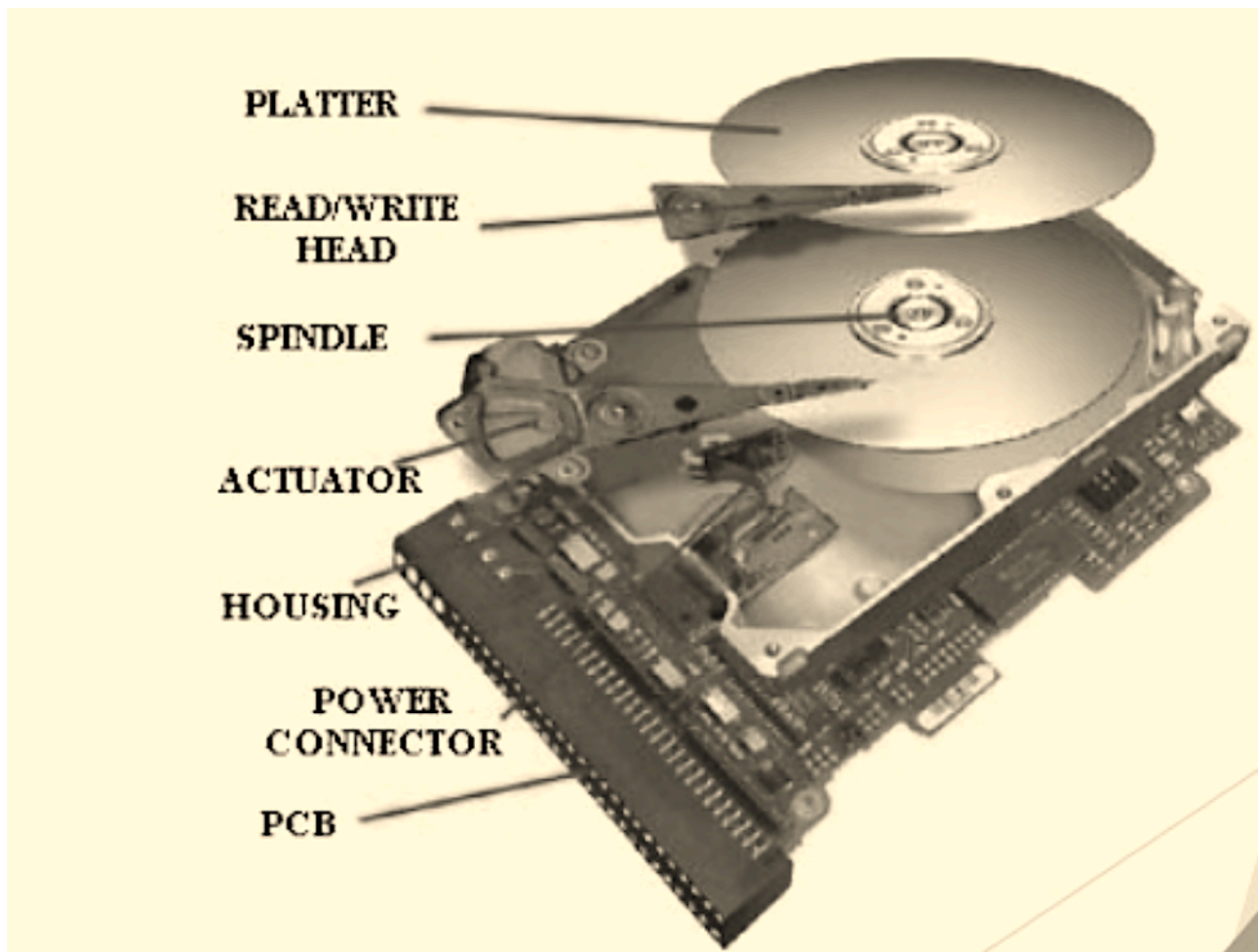
DISK GEOMETRY

Platters:

—Platters resemble the phonograph records found in an   old Fashioned Jukebox

—Multiple platters increase storage without equivalent increase in cost.

Heads:

—Each platter is associated with the read/write Head.

—They are energy converters: I.e., they transform electric signals into magnetic write the disk) and vice-versa(read the disk)

Tracks:

circular areas of the disk

—Length of a track one circumference of disk

—Over 1000 on a hard disk Data first written to outer most track

Sectors:

— Divide tracks sections

Cylinders:

Logical groupings of the same track on each disk surface in a disk unit OR

All the tracks with the same radius are known as a CYLINDER.

Clusters:

Several sectors form a duster. 64 sectors in one cluster

Groups of sectors used by operating system.