

(1)

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Computer Architecture

(Q.No: 1)

Give detail answer to each of the following)

(a) What are the advantages of a glass substrate for a magnetic disk?

The glass substrate has a number of benefits including the following improvement in the uniformity for the magnetic film surface to increase disk reliability.

A significant reduction in overall surface defects to help reduce read/write errors.

A ability to support lower fly heights.

Better stiffness to reduce disk dynamics.

greater ability to withstand shock and damage.

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(b) Define the terms track cylinder and sector?

Track:

On a magnetic disk data is organized on the platters in several rings called tracks. Or a track is that portion of a disk set of tracks described by all the heads at a single stationary head during a disk rotation a ring 1 bit wide.

Cylinders

Cylinder

The set of all the tracks in the same relative position on the platter is referred to as a cylinder.

Sector

Data are transferred to and from the disk in sectors. Or a track is divided into segments of sectors which is the basic unit of storage.

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c) Define  
Seek time:

Seek time is time required to move the disk arm to the required track. It turns out that is a difficult quantity to pin down. The seek time consists of two key components: the initial startup time and the time taken to traverse the tracks that have to be crossed once the access arm is up to speed. Time taken to position the head at the track.

Rotational Delay:

Rotational delay disks other than floppy disks rotate at speeds ranging from 3600 rpm up to as of this writing 20,000 rpm. At this latter speed there is one revolution per 3 ms. Thus on the average the rotational delay will be 1.5 ms.

Transfer time.

The transfer time to or from the disk depends on the rotation speed of the disk in the following fashion.

Access time.

The sum of the seek time of any plus the rotational delay the time is takes to go into position read - write.

d) Briefly define the seven RAID levels?

RAID Level:-

RAID level is 0 is not a true member of the RAID family because it does not include redundancy to improve performance. However there are a few application such as some on super computer in which performance and capacity are primary concerns and low cost is more important than improved reliability.

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### RAID level 1

RAID 1 differs from RAID levels 2 through 6 in the way in which redundancy is achieved. In RAID 1 redundancy is achieved by the simple expedient of duplicating all the data. In this case each logical strip is mapped to two separate physical disks so that every disk in the array has a mirror disk that contains the same data.

### RAID level 2

RAID level 2 and 3 make use of a parallel access technique. In a parallel access array all member disks participate in the execution of every I/O request. Typically the spindles of the individual drives are synchronized so that each disk has its read/write head in the same position on each disk at any given time.

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### RAID level 3:

RAID 3 is organized in a similar fashion to RAID 2. The difference is that it requires only a single redundant disk, no matter how large the disk array. RAID 3 employs parallel access, with data distributed in small strips.

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### RAID level 4:

RAID level 4 through 6 make use of an independent access technique in an independent access array. Each member disk operates independently so that separate I/O requests can be satisfied in parallel.

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### RAID level 5:

RAID 5 is organized in a similar fashion to RAID 4. The difference is that RAID 5 distributes the parity strips across all disks. A typical allocation is a round-robin scheme as illustrated in figure.

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## RAID level 6.

RAID 6 was introduced in a subsequent paper by the Berkeley researchers. In the RAID 6 scheme, two different parity calculations are carried out and stored in separate blocks on different disks.

←—————→  
(e) How is redundancy achieved in a RAID system?

RAID 1 differs from RAID levels 2 through 6 in the way in which redundancy is achieved.

In these other RAID schemes, some form of parity calculation is used to introduce redundancy whereas in RAID

1, redundancy is achieved by the simple expedient of duplicating all the data.

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f) Discuss diff optical disc products in detail?

CD

Compact disc. A nonerasable disc that stores digitized audio information. The standard system uses 12-cm disc and can record more than 60 minutes of uninterrupted playing time.

CD ROM

Compact disc read only memory

A nonerasable disc used for storing computer data. The standard system uses 12cm and can hold more than 650 Mega bytes.

CD-R

CD Recordable. Similar to a CD ROM. The user can write to the disc only once.

CD-RW

CD writable. Similar to a CD ROM. The user can erase and rewrite to the disc multiple times.



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DVD

DVD Recordable. Similar to DVD Rom. The user can write to the disk only once. Only one sided disks can be used.

DVD-RW

DVD Rewritable. Similar to a DVD-Rom. The user can erase and rewrite to the disk multiple times. Only one sided disks can be used.

Blu-ray DVD

High definition video disk. Provides considerably greater data storage density than DVD using a 405-nm laser. A single layer on a single can store 25 G. bytes.

(g) Discuss the CD read and write operation?

Read:

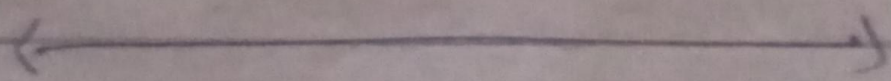
Information is retrieved from a CD Rom by a low powered laser polycarbonate while a motor spins the disk. Post it

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The intensity of the reflected light of the laser changes as it encounters a pit.

Write

Recall that on a magnetic disk information is recorded in concentric tracks with the simplest constant angular velocity (CAV) system the number of bits per track is constant. An increase in recording density is achieved with multiple zone recording in which the surface is divided into a number of zones.



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