

Date: _____

ID No

13943

Paper

Computer Architecture

Semester

Summer 2020

Date (25) 9/ ~~2020~~ 2020

Q.1:
(a)

Answer:

Q.1 Physical Characteristics of Magnetic Disks

① Location:

It deals with the location of the memory device in the computer system.

② Capacity:

The capacity of any memory are express in the term of word size, Number of words. Word are expressed in bytes (8 bit). Number of words available in the particular memory device.

③ Unit Number:

It is the maximum Number of bits that can be read or write in the memory at a time.

④ Access Methods:

It is a fundamental characteristic of memory. It is the sequence or order in which memory can be accessed.

There are three types of access methods
Random access, Serial Access, Semi random access.

⑤ Performance:

The performance of the memory system is determined using three parameters. Access Time, Memory Cycle time, Transfer Rate

(i) Access Time:

The time taken by memory to complete write and Read operation from the instant that address sent to the memory.

(ii) Memory Cycle Time:

It is only for Random access memory is the sum of the access time and the additional time required before the second access can commence.

⑥ Physical type:

Memory device can be semiconductor memory (like RAM) or magnetic surface.

⑦ Physical Characteristics:

volatile / Non-volatile
If a device continues hold data even if power is turned off. ~~The memory device~~
is

(a) Organization:

Erasable / Non-Erasable:

The memories in which data once programmed cannot be erased are called non-erasable. In which data can be ~~erasable~~ erased is called erasable.

(b)

Answer:

(a) Cache Memory:

One of the central caching policies is known as write through. This means that data stored and written into cache and to the primary storage device at the same time. One advantage of this policy is that it is ensure information will be stored safely without losing data.

(c)

Answer:

Each disk has a flat circular shape. Its two surfaces are covered with magnetic material and information is recorded on the surface. The platters of ~~data~~ hard disk are made from rigid metal or glass. The disk surface are divided into tracks, which are

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Sub divided in sectors. The arm can be positioned over any one the ~~data~~ tracks. The platter is spun at high speed.

(c)

Q. Answer.

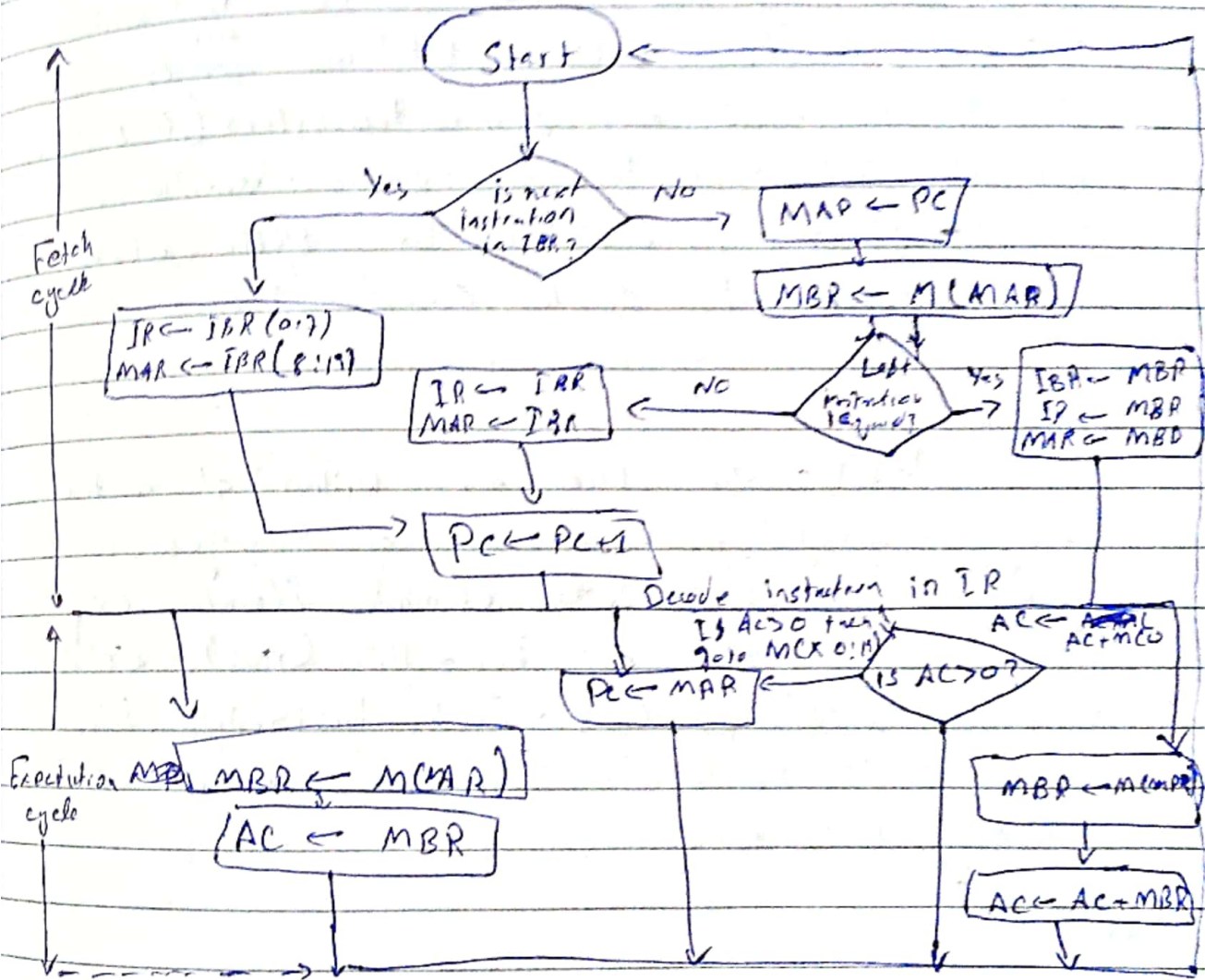
Different RAID SCHEME:

Each

scheme or RAID Level provides a difference balance among the key goals reliability performance and capacity. RAID Level greater than RAID provides protection against unrecoverable sector read errors, as well as ~~against~~ ~~against~~ against ~~raid~~ failures of whole physical drive.

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(a) Answer



(b)

Answer

A typical SRAM cell is made up of six MOSFETs. Each bit in an SRAM is stored on four transistors (M_1, M_2, M_3, M_4) that form two cross-coupled inverters. This storage cell has two stable states which are used to denote 0 and 1.

(c)

Answer

4 bits are read and written at a time. Memory array is organized as a square array of 2048×2048 elements. Elements are connected by both horizontal (rows) and vertical (columns) lines. Each horizontal line connects to the select terminal of each cell in its row.

(d)

Answer

Disk read/write heads are small parts of disk drive which move above the disk platter and transform the platter's magnetic field into electrical current (read the disk) or vice versa - transform electrical current into magnetic field (write the disk).

Q3?(b) Answer:

A split cache is a cache that contains two ~~eg~~ physical separate parts. where one part, called instruction cache which holds the instructions and the other ~~cache~~ called the data cache which holds data. A ~~cache~~ cache that is not split is called a unified cache.

(c)

Answer:Solid State Drives:

~~newer~~ A solid state drive (SSD) is faster type of device that stores data on instantly-accessible memory chips.

Hard Disk Drives:

HDD is ~~older~~ old school device that uses mechanical platters and a moving read/write head to access data.

(d)

Answer:

For the constant angular velocity (CAV) system the number of bit per track is constant. An increase in density is achieved with multiple zoned recording in which the surface is divided into number of zones, ~~where~~ with center containing more bits than zones closer to the center.

(e)

Answer:

HD DVD players have been ^{much} cheaper than Blu ray machines. Blu ray disk have more storage ~~than~~ and more advanced protections against piracy. Both versions deliver sharp resolution. Blue-Ray has 25GB capacity (50GB dual layer) and is more expensive.

Q4:

(a)

Answer:

Opcode	Operands
00000001	00000000010

In the beginning the CPU have to fetch the instruction from the ~~main~~ memory. Then the instruction will include the address of data which is required to load. Through the execution time the memory will be accessed in that time to load the data contents which is located at that address for a total of two trips to memory.