Course Name	: Computer	Course Code	: CO4E
Semester	: Fourth	Subject Code	: 17428
Subject	: CHM	Marks	: 25

Q1.   Write any THREE of the following.   **09 Marks**

1. Define motherboard form factor? List different types of form factors.

Ans: Form factor determines the general layout, size and feature placement on a motherboard.
Form factors of motherboard are

i. AT

ii. Baby AT, Full Size AT

iii. ATX
    Mini-ATX
    Micro-ATX
    Flex ATX
iv. LPX
    Mini LPX
v. NLX

2. Compare IDE HDD & SATA HDD.
 Ans:

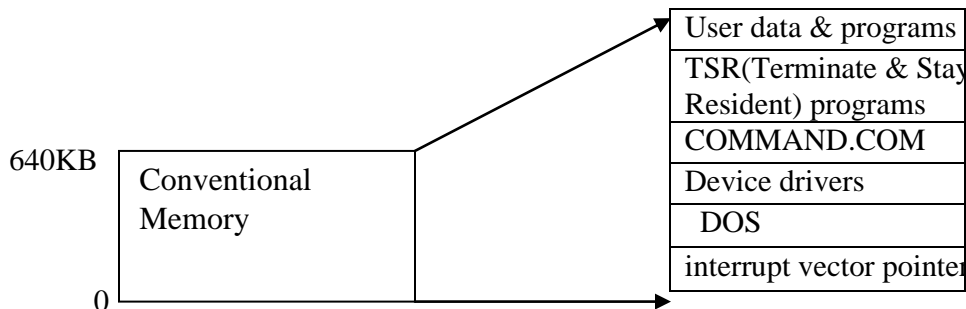| Sr. No	Parameter	IDE HDD	SATA HDD
1.	Interface	Device level interface supported	Device level interface supported
2.	Speed	Speed is low as compared to SATA and SCSI	Speed is high as compared to IDE and SCSI
3.	Used In	Used in desktop PC	Used in desktop PC
4.	Types of Cable	40/80 wire cable	4 wire cable
5.	Setup	Easy to install	Easy to install
6	Use of Adapter	Adapter not required	Adapter not required

3. Explain Conventional memory with diagram

Ans: conventional memory :

The first 640KB of system memory accessible by an Intel processor in real mode is called Conventional memory. Sometimes called base memory.

This is the area available for standard DOS programs,along with many drivers,memory resident programs & most anything else that has to run under standard DOS. Conventional memory occupies addresses 00000 h to9FFFF h.

- The bottom 1K area is used to store interrupt vector pointers
- Above is DOS itself, it's size depends on its versions.
- Above DOS loads a special class of programs called device driver.
- Above the device driver COMMAND.COM, the most command shell is stored.this takes i/p
- From the user & reformulates them in a manner that OS can understand.
- Above COMMAND.COM,TSR(Terminate & Stay Resident) programs are loaded from AUTOEXEC.BAT TSR programs are same as device drivers.
- Above the TSR, the space is available to load user data & programs.

4.Define i)Address Line ii)Data lines iii)Internal register.

Ans:

i) Address Line (Address Bus):
- The address bus is the set of wires that carries the addressing information used to describe the memory location to which the data is being sent or from which the data is being retrieved.
- The size (or width) of the address bus indicates the maximum amount of RAM a chip can address.

ii) Data Line (Data Bus):
- The bundle of wires (or pins) used to send and receive data.
- The more signals that can be sent at the same time, the more data can be transmitted in a specified interval and, therefore, the faster (and wider) the bus.
- Modern processors data bus can transfer 64 bits of data at a time to and from the motherboard chipset or system memory.

iii) Internal Register:
- The size of the internal registers indicates how much information the processor can operate on at one time and how it moves data around internally within the chip. This is sometimes also referred to as the internal data bus.
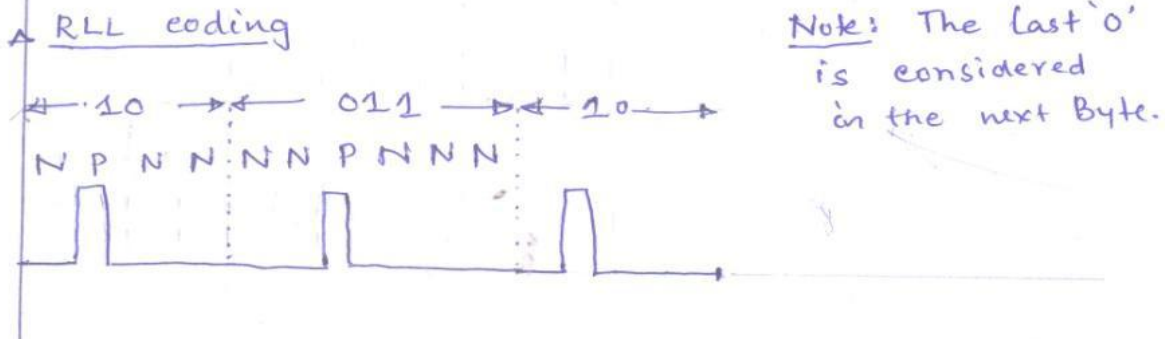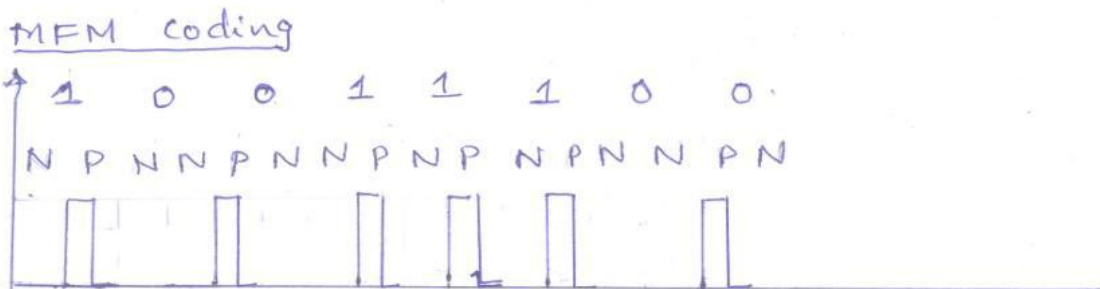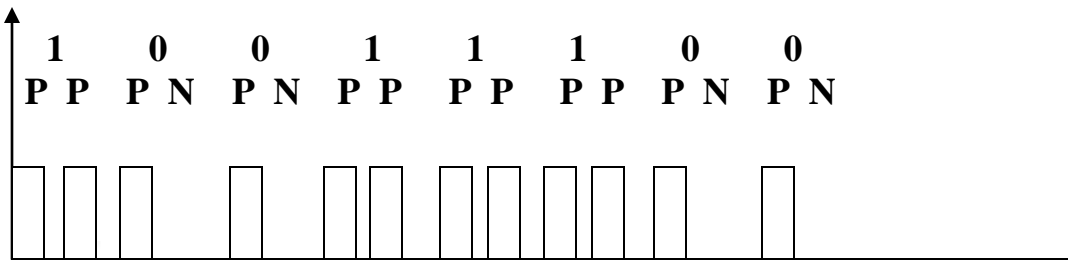- A *register* is a holding cell within the processor.

Q2. Write any TWO of the following. 08 Marks
1. Draw the waveform for data stream 1001 1100 (FM & MFM)
Ans:

2. Compare internal cache & external cache
Ans:

Internal cache	External cache
Internal also called The L1 cache or integral cache is always a part of the processor chip.	External cache also called The L2 cache; it was external to the processor chip when it was introduced.
L1 cache was originally 8 KB. (small size)	L2 cache was originally 128 KB.(bigger size than L1)
It was the fastest cache in the system.	To improve the performance of the system, L2 cache was directly incorporated as part of the processor die.
This is directly accessible to processor.	This resides in between processor and RAM.
L1 cache always runs at full processor speed. (faster)	It was present on the motherboard and used to run at CPU bus speed. (slower)
High cost	Low cost

3. Explain **any four components** of HDD.

Ans: Components of HDD:

1.   Disk Platter:
 HDD stores information on one or more flat circular discs called "Platters"
•   Platter sizes are 5.12 inch, 3.74 inch etc.
•   Two types of recording media used in HDD.
a.   Iron-oxide media
        -very soft, less density recording.
b.   Thin-film media
         -thin, hard & perfect coating.
         -high density recording.
        -polished platter surface is coated with lubricating material to avoid head crash

2. Read/Write(R/W) Head-
    It is used to read the data from HDD platter & to write the data on to the HDD platter.
Different types of R/W Head:
    1.   Ferrite head
    2.   Metal-in-gap head
    3.   Thin-film head
    4.   Magneto-resistive head
    5.   Giant magneto- resistive head

3. Head arm/head slider-
 It is an arm on which r/w head of HDD is located.

4. Head Actuator mechanism
 - It is the mechanism to move R/W head.
There are two types of mechanisms are used
i)Stepper motor actuator mechanism:
 - Stepper motor is a special motor that rotates in steps & turns a fixed angle. Stepper motor
connected to R/W head using two methods:

a) Split metal band mechanism
b) Rack in pinion gear mechanism
ii)Voice coil actuator mechanism.
 - It is the mechanism to move R/W head.
There are two methods for it:
 a) Linear voice coil actuator
 b) Rotary voice coil actuator

5. Spindle Motor
 - It is used to rotate HDD platters.
6) Logic board
 - It is used to control different parts of HDD.

7) Air filter:
 HDD does not work in vacuum condition; So R/W head need air to Stroke on disk surface.
 Types:
 a) Recalculating filter.
 -used to filter dislodged particles inside the drive.
 b) Breath/barometric filter.
 -equalize internal & external pressure.
8) The Faceplate or Bezel
 At one time, hard disk drive vendors offered a front faceplate, or bezel, as an option
 In most systems today, the bezel is a part of the case and not the drive itself.

9. Cables and Connectors
 Hard disk drives typically have several connectors for interfacing to the computer,
 receiving power, and sometimes grounding to the system chassis. Most drives have at least
 these three types of connectors:
 ■ Interface connector(s)-IDE/SATA/SCSI
 -   The interface connectors are the most important because they carry the data and
 command signals between the system and the drive.
 ■ Power connector
 The power is supplied via the larger four-pin peripheral power connector found on all PC
 power supplies.
 ■ Optional ground connector (tab)
 A grounding tab provides an optional ground connection between the drive and the
 system's chassis.

Q3.   Write any TWO of the following.   08 Marks
 1. Explain the terms related to HDD
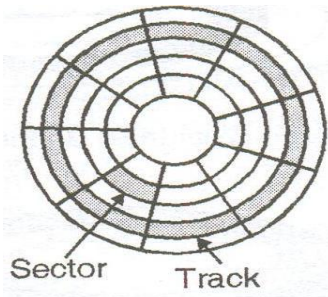 i) Track ii) Sector iii) Cylinder iv) Cluster.
 Ans:
 i.Track
 ・Each side of HDD platter's surface is divided into concentric circles called tracks
 ・They are magnetic information written during formatting of HDD
 ・Outermost track is called track 0. The innermost will have the highest number
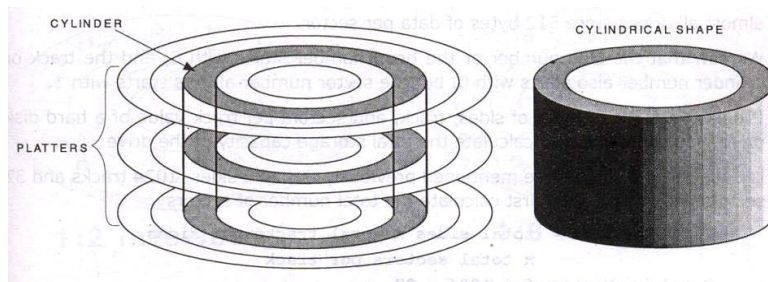
ii.Sector

- The formatting program divides disk surface into sectors by writing magnetic pattern on disk surface
- Different HDD capacities have different number of tracks.
- 512 byte data can be stored in each sector. Sector no. starts from 1.

Sector   Track

iii.Cylinder

- Same tracks of different platters form an imaginary cylinder like structure
- Data is stored cylinder by cylinder
- All tracks on a cylinder are written and then the R/W head moves to the next Cylinder. These reduces movement of R/W head and increases the speed of read and write operation.
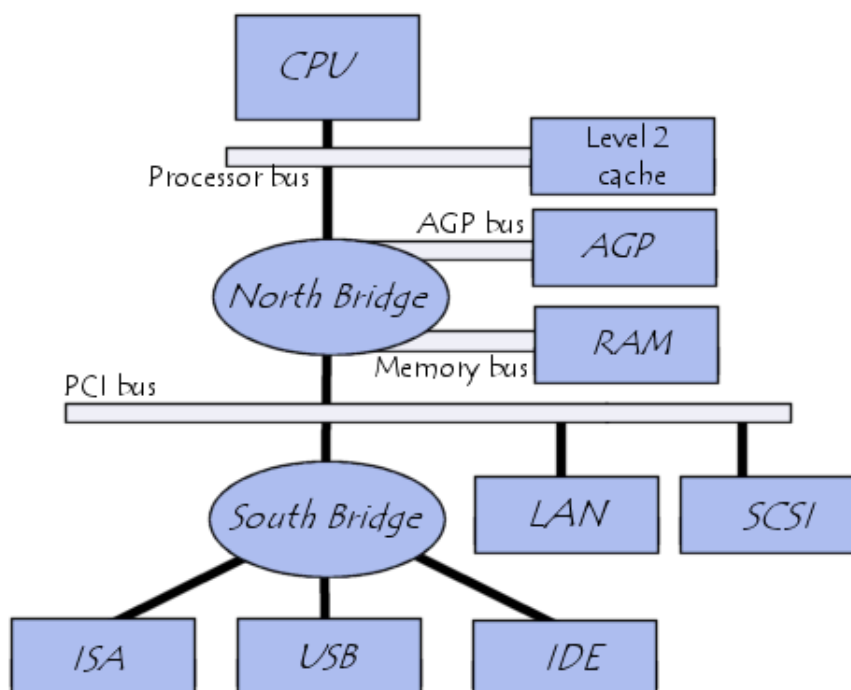

iv.Cluster

- When OS writes some information on the hard disk, it does not allocate the space sector wise, instead uses a new unit of storage called "Cluster" .
- Clusters are the minimum space allocated by DOS when storing any information on the disk
- Even to store only one byte long information on the disk requires minimum one cluster area on the disk surface.

2] Explain North Bridge/South Bridge Architecture with diagram.

Ans:

North Bridge: It is the connection between the high speed processor bus and the slower AGP & PCI buses. It is responsible for communication from the CPU to memory, the CPU to the PCI (Peripheral Component Interconnect) Express bus, and the Advanced Graphics Port (AGP) device. It is the only motherboard circuit (besides the processor) that runs at the full motherboard speed. It serves as the four way connection between CPU, Memory, Video card and south bridge .

South Bridge: It is the bridge between PCI bus and even slower ISA bus. It is responsible for communication between the CPU and other devices, such as PCI, ISA, and IDE devices. The Southbridge actually contains some on Chip integrated peripherals, such as Ethernet, USB and audio devices. It is responsible for communication between the CPU and other devices, such as PCI, ISA, and IDE devices. These two chips contain the bulk of the logic that allows a CPU to communicate with other hardware.

3.What is BIOS? Write any three function of it.

   (1-mark for Definition, 3-marks **for any three functions**)

Ans:

  The BIOS (Basic Input Output System) provides the processor with the information required to boot the system from a non-volatile storage unit (HDD, FDD, CD or other). It provides the system with the settings and resources that are available on the system.
   BIOS is an electronic set of instructions that a computer uses to successfully start operating. The BIOS is located on a chip inside of the computer and is designed in a way that protects it from disk failure.

  Main functions of BIOS

1. The main function of the BIOS is to give instructions for the power-on-self-test (POST). This self-test ensures that the computer has all of the necessary parts and functionality needed to successfully start itself, such as use of memory, a keyboard and other parts.

2. If errors are detected during the test, the BIOS instruct the computer to give a code that reveals the problem. Error codes are typically a series of beeps heard shortly after startup.

3. The BIOS also works to give the computer basic information about how to interact with some critical components such as drives and memory that it will need to load the operating system.

4. Once the basic instructions have been loaded and the self-test has been passed, the computer can proceed with loading the operating system from one of the attached drives.

5. Computer users can often make certain adjustments to the BIOS through a configuration screen on the computer. The setup screen is typically accessed with a special key sequence during the first moments of the startup. This setup screen often allows users to change the order in which drives are accessed during startup and control the functionality of a number of critical devices. Features vary among individual BIOS versions.

6. Many PC manufacturers today use flash memory cards to hold BIOS information. This allows users to update the BIOS version on computers after a vendor releases an update. This system was designed to solve problems with the original BIOS or to add new functionality. Users can periodically check for updated BIOS versions, as some vendors release a dozen or more updates over the course of a product's lifetime. To check for updated BIOS, users can check the website of the specific hardware vendor.

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