

NAME:-					
BRANCH:-			SUBJECT:-		
REGD NO:-			SEM:-		YEAR:-
SL. NO.	NAME OF THE EXPERIMENT	EXPERIMENT DATE	ENDING DATE	CHECKED BY	REMARKS
1	INTRODUCTION TO HARDWARE MAINTENANCE				
2	TO IDENTIFY & STUDY THE DIFFERENT PARTS OF MOTHEBOARD				
3	TO STUDY THE EXPANSION SLOTS,BUS STRUCTURE & PORTS WITH COLOR CODES				
4	TO STUDY THE SMPS WITH OUTPUT VOLTAGE & CONNECTIONS				
5	TO STUDY THE HDD INTERFACES				
6	TO STUDY THE CONNECTING HARDWARE COMPONENT FOR ASSEMBLY OF COMPUTER				
7	SETTING OF CMOS				
8	TO INSTALL & CONFIGURE WINDOWS 7 OPERATING SYSTEM				
9	TO INSTALL & CONFIGURE WINDOWS 8 OPERATING SYSTEM				
10	TO INSTALL & CONFIGURE WINDOWS10 OPERATING SYSTEM				
11	INSTALLING DIFFERENT APPLICATION SOFTWARE				
12	STUDY DIFFERENT BIOS SETUP & DIFFERENT FAULTS				
13	PERFORM TROUBLESHOOTING IN DESKTOP & LAPTOP				



TH-4 COMPUTER HARDWARE& MAINTENANCE

Theory	4 Periods per week	Internal Assessment	20 Marks
Total Periods	60 Periods	End Sem Exam	80 Marks
Examination	3hours	Total Marks	100 Marks

A. Topic wise distribution of periods

Sl.No	Topic	Periods
1	COMPUTER CENTRE MANAGEMENT	8
2	SITE PREPARATION & INSTALLATION	8
3	MOTHER BOARD and COMPONENTS	12
4	MEMORY AND I/O DEVICES	12
5	DISPLAY , POWER SUPPLY AND BIOS	5
6	MAINTENANCE AND TROUBLE SHOOTING	10
7	NETWORKING DEVICES AND THEIR INTERFACES	5
	TOTAL	60

B. RATIONALE

This subject shall give exposure to the students on different principles to be followed in Computer Centre management. It will also give idea about the different components of Computers both Desktop and Laptops. It shall also give idea about the method of assembly, disassembling of computers and different trouble shooting techniques.

C. OBJECTIVE

After undergoing the course, the students will be able to:

- Know about the manpower engaged in computer centre
- Know about the site preparation for computer centre furnishing
- Know about the details of Motherboard
- Know about the different components of computers
- Know about the working principles of different I/O devices
- Assemble the desktop computers

- Troubleshoot both Desktop and Laptop computers

D. DETAIL CONTENTS:

1. COMPUTER CENTRE MANAGEMENT

- 1.1 Need of Management in Computer Centre
- 1.2 Types of Jobs carried out in computers in an organization
- 1.3 Duties and responsibilities of personnel involved
- 1.4 Need of Training of Staff
- 1.5 Idea about Various makes of Computers

2. SITE PREPARATION & INSTALLATION

- 2.1 Layouts of computer centre
- 2.2 False Roofing, Air Conditioning, Dust Proofing
- 2.3 Power Conditioning equipments like CVT, UPS, Isolation Circuits with principles of functioning

3. MOTHER BOARD and COMPONENTS

- 3.1 Components and slots (Processor socket/slot, memory sockets, Chip sets, Cache, BIOS, Clock Generator, RTC, I/O Controller, power Connector, Key Board/Mouse Connectors, Jumpers, Pin Connectors etc)
- 3.2 Mother architecture and Block Diagram
- 3.3 Processors (Core2 Duo Processor, Quad Core Processor, Core i3,i5,i7 series, AMD A10 series, Xeon Processor)
- 3.4 Chip Sets
- 3.5 Bus Standards: PCI, AGP, USB etc.
- 3.6 Colour Codes for Devices/ports

4. MEMORY AND I/O DEVICES

- 4.1 Primary and secondary Memory
- 4.2 Memory speed , Access time
- 4.3 Hard Disk, Construction, Working Principles
- 4.4 File System, Formatting, Partitioning
- 4.5 Removable Storage and Special devices and their working principles(CD, DVD, External drives, Memory stick, USB flash drive, Solid state drive)
- 4.6 Key Board(Interfacing, USB, Wireless, Types of keys, Keyboard Matrix, Key Bouncing)
- 4.7 Mouse Interfacing
- 4.8 Printers(Types, operation and Troubleshooting)
- 4.9 Scanners(Types, operation and Trouble Shooting)

5. DISPLAY , POWER SUPPLY AND BIOS

- 5.1 Displays and Graphics Cards
- 5.2 LCD,PLASMA,TFT,LED Displays
- 5.3 SMPS (Basic Principles and operations, O/P voltage)
- 5.4 BIOS(Functions, setups, types of BIOS)
- 5.5 POST(Operation, Faults related to Hardware)

6. MAINTENANCE AND TROUBLE SHOOTING

- 6.1 Assembly of Components of Desktop Computers
- 6.2 Configuring Laptops and Power settings

- 6.3 Laptop Components(Adapter , Battery, Basic problems, RAM types, CPU types, Laptop Motherboard, block diagram, Laptop Keyboard)
- 6.4 Formatting , Partitioning and installation of OS
- 6.5 Trouble shooting of Commonly faced problems in Desktops and Laptops
- 6.6 Basic Maintenance concepts(Preventive, Corrective, online)
- 6.7 Diagnostic programs and tools
- 6.8 Methods of Trouble shooting(symptom observation, analysis, diagnosis, Correction)
- 6.9 Up gradation of system and application software
- 6.10 Virus concepts, Antivirus

7. NETWORKING DEVICES AND THEIR INTERFACES

- 7.1 Network Interface card
- 7.2 Networking interconnecting devices such as hub, switch, Router
- 7.3 Types of Network cable
- 7.4 Types of Network connector

Coverage of Syllabus up to Internal Exams (I.A.)
Chapter 1,2,3,4

Books Recommended:

Sl.No	Name of Authors	Title of the Book	Name of the Publisher
01	Utpal Banarji,	Computer Management & Planning	TMH
02	B. Singh	PC Hardware	Firewall
03		PC Architecture Part I& II	Firewall
04	J Raventha	PC Repair and Maintenanc	Firewall
05	D.Balsubramanian	Computer Installation and servicing	TMH

CONTENT

Q) What is Hardware?

Ans:-Hardware includes the physical parts of a computer such as the case Central Processing Unit (CPU), monitor, mouse, keyboard, computer data storage, graphical card, sound card, speaker & motherboard.

Hardware is typically directed by the software to execute any command or instruction.

Q)What is Software?

Ans:- Collection of the programs for the specific need is known as software. Software can be affected by the virus. Software can be transferred from one place to another electrically through network.

Q)What is Motherboard?

Ans:- A motherboard is a circuit board inside general-purpose computing systems, including personal computers, smart televisions, smart monitors, and other similar devices, which supports communication between different electrical components and houses components such as the CPU, memory.

Q)What is components of motherboard?

Ans:-There are CPU, memory, storage, ROM BIOS, Southbridge and Northbridge chipsets, cooling fans, peripheral connector slots, connectors for peripheral devices, the battery backup and the power connector, etc.

Q)What is feature of motherboard?

Ans:-

- Motherboard varies greatly in supporting various types of components.
- Motherboard supports a single type of CPU and few types of memories.
- Video cards, Hard drives, Sound cards have to be compatible with the motherboard to function properly.
- Motherboard, Cases, and Power supplies must be compatible to work properly together.

Q)What is Ram and its type?

Ans:- It refers to computer chips that temporarily store dynamic data to enhance computer performance while you are working. It is the working place of your computer, where active are loaded so that any of the processor requires them, it doesn't have to fetch them from the hard disk. It is volatile, means it loses its content once power is turned off. This is different from non-volatile memory such as hard-disk & flash memory which do not require a power source to retain data when a computer shuts down properly to permanent storage on the hard disk or flash drive.

There are two types

SRAM

DRAM

Q) What is Rom and its type?

Ans:- ROM stands for Read-Only Memory. It is a non-volatile memory that is used to store important information which is used to operate the system. As its name refers to read-only memory, we can only read the programs and data stored on it. It is also a primary memory unit of the computer system. It contains some electronic fuses that can be programmed for a piece of specific information. The information is stored in the ROM in binary format. It is also known as permanent memory.

There are three types

MROM (Masked read-only memory)

PROM (Programmable read-only memory)

EPROM (Erasable programmable read-only memory)

EEPROM

Q)What is expansion slot ?

Ans:- An expansion slot is a bus slot or expansion port found on the motherboard of a computer. It performs as a socket on the motherboard. Basically, it holds expansion cards featured in a computer so that it can use those features for better operation—say, a video card for better graphics and sound, Ethernet for an increased internet speed, and memory for an increased storage capacity. Any slot on the motherboard that can hold an expansion card is an expansion slot. For example, you purchase a video card that fits the one you want to upgrade and then install it into an appropriate expansion slot. An expansion slot is part of the motherboard or parent board of a computer and is designed to hold an added card, like a video graphics card, in improving a computer's performance.

Q)What is AGP?

Ans:- An Accelerated Graphics Port (AGP) is a point to point channel that is used for high-speed video output. This port is used to connect graphic cards to a computer's motherboard. It increases the speed at which machines can render graphics while using the system's resources more efficiently. The primary purpose of an AGP is to convey 3-D images much more smoothly than is possible on a regular PC.

Q)What is PCI?

Ans:- PCI stands for Peripheral Component Interconnect. It could be a standard information transport that was common in computers from 1993 to 2007 or so. It was for a long time the standard transport for extension cards in computers, like sound cards, network cards, etc. It was a parallel transport, that, in its most common shape, had a clock speed of 66 MHz, and can either be 32 or 64 bits wide. It has since been replaced by PCI Express, which could be a serial transport as contradicted to PCI. A PCI port, or, more precisely, PCI opening, is essentially the connector that's utilized to put through the card to the transport. When purge, it basically sits there and does nothing.

Q)What is SMPS?

Ans:-It stands for switched mode power supply . A switching regulator is included in an electronic power supply called a switched-mode power supply (SMPS) to facilitate effective electrical power conversion. An SMPS converts voltage and current while transferring power to DC loads via a DC or AC source, just like other suppliers

Q)What is advantages and disadvantages of SMPS?

Ans:-

Advantages of SMPS

- The SMPS weighs relatively little.
- The production spectrum of SMPS is broad.
- The switch-mode power supply has a compact size.
- Strongly anti-interference.
- It is recommended to use SMPS power consumption, which is normally between 60 - 70 percent.

Disadvantages of SMPS

- The SMPS has a very high level of complexity.
- There is only one voltage output in an SMPS.
- SMPS control is poorer and its output ripple is higher.
- In the case of SMPS, the production reflect is substantial and its control is inadequate.

SMPS usage is limited to step-down regulation.

Q)What is Application of SMPS

Ans:-

- Their main applications are in power stations, refrigerators, ovens, and personal computers.
- A frequency converter can be used to convert D.C. voltages to D.C. and A.C. voltages to A.C.
- They are utilized to supply variable power and voltages in factories and manufacturing facilities.
- They are also utilized in power plants, servers, airports, railroads, security systems, and railroads.
- These are found in contemporary smartphones.
- Uncontrolled DV input voltage balancing is another application for the SMPS.
- They are employed in electrical machinery.
- The auto industry also makes use of SMPS devices.
- The purpose of the SMPS is to balance the excess current and stabilize the electric current.

Q)What is HDD?

Ans:- The disk is divided into tracks. Each track is further divided into sectors. The point to be noted here is that the outer tracks are bigger than the inner tracks but they contain the same number of sectors and have equal storage capacity. This is because the storage density is high in sectors of the inner tracks whereas the bits are sparsely arranged in sectors of the outer tracks. Some space in every sector is used for formatting. So, the actual capacity of a sector is less than the given capacity. The read-write (R-W) head moves over the rotating hard disk. It is this Read-Write head that performs all the read and write operations on the disk and hence, the position of the R-W head is a major concern. To perform a read or write operation on a memory location, we need to place the R-W head over that position.

Q)What is advantages and disadvantages of HDD?

Ans:-

Advantages of HDD

- Capacity Limit: HDDs offer enormous stockpiling limits contrasted with other auxiliary memory choices, making them appropriate for putting away immense measures of information, including media records, reports, and applications.
- Practical: HDDs are by and large more savvy per unit of capacity contrasted with strong state drives (SSDs) and other fast stockpiling choices, pursuing them a favored decision for those requiring broad capacity without burning through every last cent.
- Mature Innovation: HDDs have been around for quite a while, making them a deep rooted and solid innovation. They've gone through various refinements and upgrades, coming about in vigorous, tried, and dependable capacity arrangements.
- Similarity: HDDs are viable with most PCs and working frameworks, guaranteeing simplicity of coordination and use across various stages.
- Successive Read/Compose Execution: In specific situations, especially with huge document moves or consecutive information access, HDDs can give fair read and compose speeds.

Disadvantages of HDD

- For complex files HDD are slow.
- HDD produce huge amount of heat while working.
- The mechanical part of Hard Disk Drive require more power to operate.
- HDD are less durable for especially for portable device.
- When HDD operates, it produces a lot of noise.

Q)What is BIOS?

Ans:- BIOS in a computer stands for "Basic Input/Output System". It's a crucial program that a computer uses to start up and run. When you turn on your computer, BIOS is the first thing that runs. It checks and manages all the important parts of your computer, like the processor, memory, and storage.

BIOS also helps your computer communicate with devices like the keyboard and mouse. It's like the foundation that helps your computer work properly.

Q)What is CMOS Battery?

Ans:- The CMOS (complementary metal oxide semiconductor) battery, also called coin-cell battery on the motherboard helps the BIOS or UEFI to store the hardware configuration settings. It helps keep a record of the date and time when the computer is switched off.

Q)What is NIC and its type?

Ans:- A network interface card (NIC) is a hardware component, typically a circuit board or chip, installed on a computer so it can connect to a network

Types of NIC

Wired NICs (Ethernet NIC)

It was created by Robert Metcalfe in 1980. This types of NICs uses cables to connect to a networks. It is more secure as compare to wireless. It supports high-speed data up to 1 Gbps. It Establishes more stable connections as compared to wireless networks. This type of NICs used in LAN, MAN and WAN networks, as well as for gaming and video conferencing.

Examples : TP-Link TG-3468 Gigabit PCI Express Network Adapter, Integrated Ethernet NICs.

Wireless NICs

This type of NICs uses radio signals to connect to a network. They are commonly used for Wi-Fi connections. It is more portable, often built into devices like laptops and phones. Wireless capability can also be added to computers without built-in Wi-Fi.

Experiment : 01

AIM OF THE EXPERIMENT

Introduction to hardware maintenance.

DEFINITION OF HARDWARE

Hardware includes the physical parts of a computer such as the case Central Processing Unit (CPU), monitor, mouse, keyboard, computer data storage, graphical card, sound card, speaker & motherboard.

Hardware is typically directed by the software to execute any command or instruction

DIFFERENCE BETWEEN HARDWARE & SOFTWARE

Hardware	Software
(i) Physical part of a computer is known as hardware.	(i) Collection of the programs for the specific need is known as software.
(ii) Hardware cannot be affected by the virus.	(ii) Software can be affected by the virus.
(iii) Hardware cannot be transferred from one place to another electrically through network.	(iii) Software can be transferred from one place to another electrically through network.
(iv) Maintenance cost is high .	(iv) Maintenance cost is low .
(v) Update version will not available in hardware.	(v) Update version will available in software.
(vi) Example: Keyboard, mouse, CPU, monitor, printer, hard disk etc.	(vi)) Example: OS, word, excel, notepad, wordpad ,google, chrome etc.

Components of Hardware.

- (i) Input Unit (Keyboard & Mouse)
- (ii) Output Unit (Monitor & printer, projector).
- (iii) Storage Unit (Hard disk, SSD)
- (iv) Processing Unit (CPU)

Internal part of the computer:

- (i) Motherboard
- (ii) Processor
- (ii) Hard Disk
- (iv) RAM Slot
- (v) AGP (Accelerated Graphics Port) slot
- (vi) PCI (Peripheral component Interconnect) slot

Why hardware maintainance is required?

- Faster computer access
- Virus Free
- Maintainance cost will be reduced.
- Reduce your risk.
- Life spam of computer will be increase .
- User can access any software smoothy

CONCLUSION

The above experiment has been done by me successfully.

Experiment : 02

NAME OF THE EXPERIMENT

Study of layout of motherboard & different components

AIM OF THE EXPERIMENT

To identify & study the different parts of motherboard.

COMPONENTS REQUIRED

Different types of motherboard.

THEORY

Motherboard or the mainboard is the most important section in any computer system. No computer system can operate without its motherboard is easily identified in the system by its size or shape. It holds many of the crucial electronic components of the systems such as the central processing unit (CPU) & memory, provides connectors for others peripherals. A PC motherboard contains numerous logic devices, memory chips & other electronic components. & circuits, in addition to it different expansion and RAM slots. Various Components of the motherboard are CPU, RAM, BIOS, cache memory, Buffer IC's, Latch IC's, numeric, co-processor, I/O interface controllers ,Logic chips, decoders. & other electronic components such as transistors, diodes, capacitors, resistors, crystal oscillators, Jumpers, dip switches, various type of connector & slots.

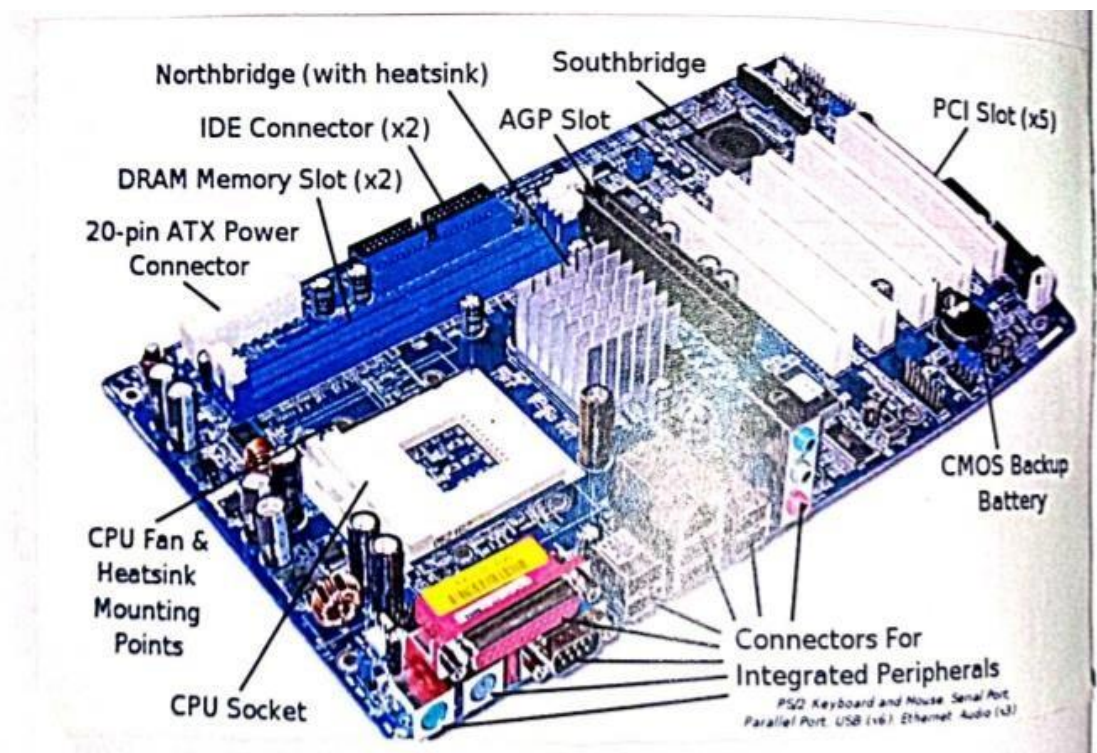
Some of popular manufactures of the motherboard.

- (i) Intel
- (ii) Asus
- (iii) Aopen
- (iv) ABIT
- (v) BioStar
- (vi) Gigabyte
- (vii) MST

→The motherboard may be characterized by the

(i) Form factor: It may be characterized by the refer's to the motherboard's geometry, dimensions, arrangement & electric requirements. Advanced Technology Extended (AT is the most common design of motherboard for desktop computers.

(ii) Chipset: It is a circuit, which is used to controls the resources such as the bus interface with the processor, cache memory & RAM, expansion cards etc. It is used to co-ordinate data transfers between the various components of the computer.



Types of Processor socket: The processor socket is a connector into which the processor is mounted. The BIOS & CMOS core present on the motherboard.

Major Motherboard components & their Functions:

Microprocessor: It is also known as the processor the CPU is the computer's brain. It is responsible for fetching, de coding & executing program instructions as well as performing mathematical & logical calculations. The processor chips are identified by the processor type the manufacture This information chip itself. usually described in the chip itself.

→For example: Intel 386, Advanced Micro Devices (AMD) 386, Cyrix 486, Pentium MMX, Intel core 2 Duo or Core i7.

RAM (Random Access Memory):-

It refers to computer chips that temporarily store dynamic data to enhance computer performance while you are working. It is the working place of your computer, where active are loaded so that any of the processor requires them, it doesn't trave to fetch them from the hard disk. It is volatile, means it loses its content once power is turned off. This is different from non-volatile memory such as hard-disk & flash memory which do not require a power source to retain data when a computer shuts down properly to permanent storage on the hard disk or flash drive. At the next bootup , RAM begins to fill programs automatically loaded as startup a process called booting . Later on , the user open files & programs that are still loaded in memory.

The BIOS:

BIOS stands for Basic Input Output System. BIOS is a "read-only" memory, which consists of low-level software that controls the system hardware & acts as an interface between the OS & hardware. Most people know the term BIOS by another name: device drivers or just drivers. BIOS is essentially the link between the computer hardware & software in a system.

The CMOS Battery:

Motherboard also includes a small separate block of memory from (RAM chips which are kept alive by a battery (known as CMOS battery) even when the PC's power is off. This prevents reconfiguration when the PC is powered on.

Computer Chipsets:

A chipset is a group of small circuits that coordinate the flow of data to & from a PC's key components. These key components include the CPU itself, the main memory, the secondary cache & any devices situated on the buses. A chipset also controls data flow to & from hard disks & other devices connected to the IDE channels. A computer has got two main chipsets:

→The north bridge (also called the memory controller) is in charge of controlling transfers between the processor & the RAM which is why it is located physically near the processor. It is sometimes called the GMCH, for Graphic & memory Controller Hub.

→The southbridge (also called the I/O controller) handles communications between slower peripheral devices. It is also called the ICH (I/O controller Hub). The term "bridge" is generally used to designate a component which connects two buses.

The CPU Clock:

The CPU clock synchronizes the operation of all parts of the PC & provides the basic timing signal for the CPU. Using a quartz crystal, the CPU clock breathes life into the microprocessor by feeding it a constant flow of pulses.

For example, a 200MHz CPU receives 200 million pulses per second from the clock. A 2GHz CPU gets two billion pulses per second. Similarly, in any communication devices, a clock may be used to synchronize the data pulses between sender and receiver.

Types of slots used in motherboard:

- (i) I/O slots
- (ii) Memory slots
- (iii) CPU slots [used only for slot type processor]

Types of I/O slots:

- (i) 8 bit ISA
- (ii) 16 bit ISA
- (iii) MCA
- (iv) VESA
- (v) PCT
- (vi) AGP
- (vii) 32 bit FISA

Types of connectors used in motherboard:

- (i) IDE connector
- (ii) SATA Connector
- (iii) Floppy connector
- (iv) Power supply connector
- (v) Keyboard connector [PS/2 or USB] Mouse Connector [PS/2 or USB]
- (vi) VGA connector [monitor data connector]
- (vii) Parallel Port
- (viii) Serial port
- (ix) Audio connector
- (x) LED connector
- (xi) FAN connector

EXPERIMENT : 03

AIM OF THE EXPERIMENT

To study the expansion slots, Bus structure & ports with color codes.

COMPONENTS REQUIRED

Different types of cards/ports.

THEORY:

Motherboard has different types of expansion slots available which are used to expand the Compatibility of our system. The slots provide connection to the system bus. There are different kinds of slot available, one is PCI which is a general expansion slots like PCIe (PCI express) are used to provide different pathways to the system bus.

AGP:

It stands for Accelerated graphics Port. AGP is an advanced port designed for video cards & 3D accelerations. Developed by Intel & introduced in August 1997. AGP introduces a dedicated point-to-point channel that allows the graphic controller direct access to system memory. It is used in video card.

AMR: It stands for Audio modem Riser. It allows OEMS to make one card with functionality of either a modem or audio or both as one card. It is used in modem, sound card..

CNR: It stands for communication network riser. CNR is a specification that supports audio, modem, USB & LAN interfaces of core logic chip: -sets. It is used in modem, Network card, sound card.

EISA: It stands for Extended Industry Standard Architecture EISA is a standard first announced in september 1998 for IBM Compatible computers the completed with the MCA Bus.

ISA: It stands for Industry Standard Architecture ISA was introduced by IBM & headed by Mark Dean. It is used in network card, sound card, video card.

PCI: It stands for peripheral component interconnect It was introduced by INTEL in 1992. The PCI bus. came in both 32-bit & 64 bit versions & was used for network card, video card, sound card.

PCI Express: PCI Express or PCIe, was approved in July 2002 as a serial computer expansion bus. Standard PCI Express was designed as a high-speed replacement for the aging PCI & AGP Standards & is available, in different formats. The data transmitted over PCI Express is sent over wires. It is used for video cards.

VESA: It stands for Video Electronics Standard Association. VESA is a group of monitor & video card manufacturers that set video display & bus standards.

CONCLUSION

We studied different expansion slots, bus structure & ports with color codes successfully.

EXPERIMENT -04

AIM OF THE EXPERIMENT:

To study the functioning of SMPS with output voltage and connectors.

COMPONENTS REQUIRED:

SMPS, Power card, Multimeter etc.

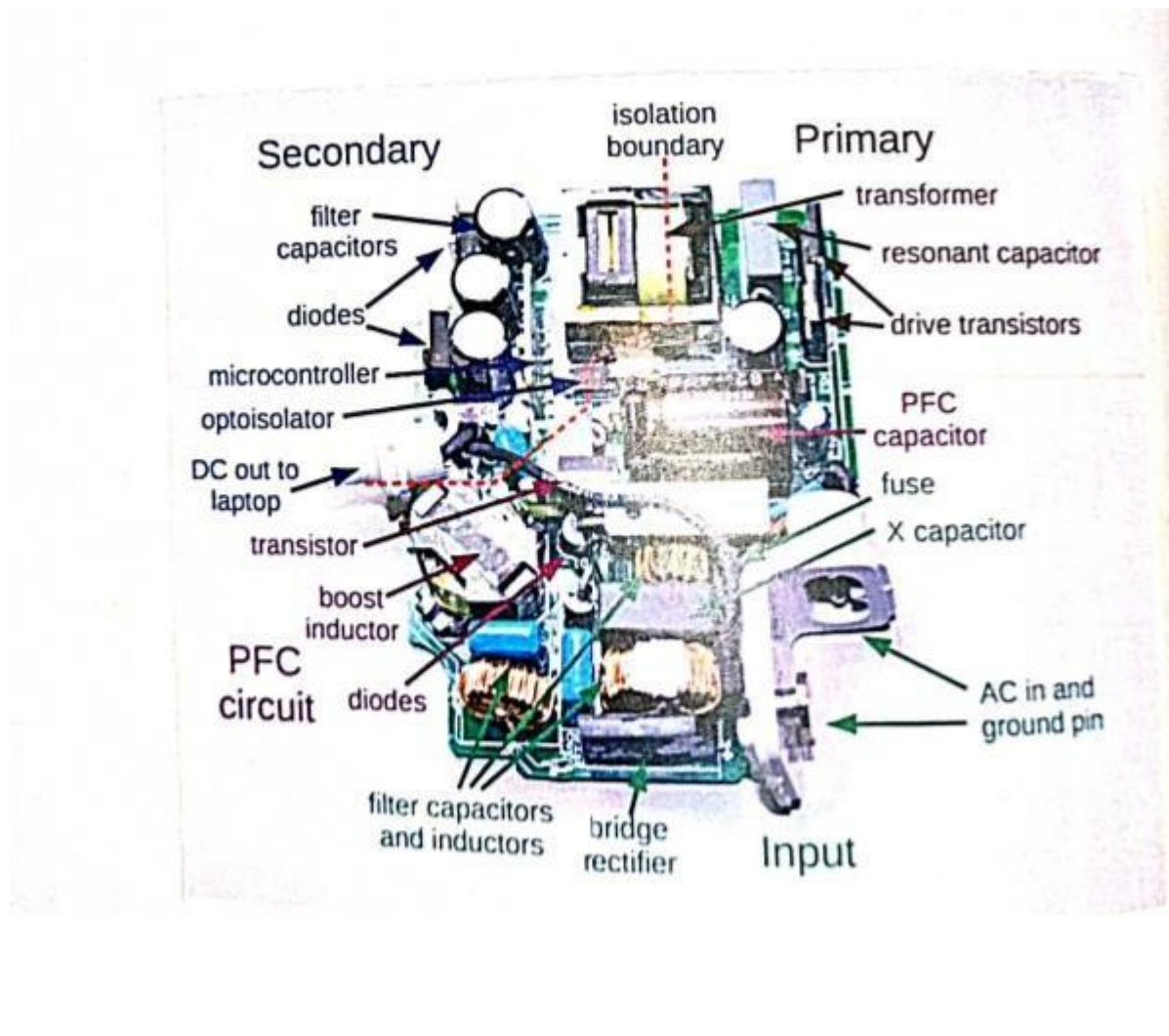
THEORY:

SMPS (Switch Mode Power Supply)

In a personal computer (PC), the power supply is the metal box usually found in a corner of the case. the power supply is visible from at the back of many systems because it contains the power cord receptacle and the cooling fan.. A power supply unit (PSU) converts main AC to low voltage regulated DC power for the internal components of a computer. Modern personal computer universally use a switched mode power supply Some power supplies have a manual selector for input voltage, while others automatically adopt to the Supply voltage.

ATX power supplies are turned on & off by a signal from the motherboard. They also provide a Signal to the motherboard to indicate when the DC power lines are correct so that the computer is able to the main supply it provides a 5v stand by(5VSB) Line. So that the stand by functions on the computer & certain peripherals are powered.

→There are two major types of computer power Supplies AT & ATX.



(i) **AT Power Supply:** An AT power supply is what was used for older computers. This type of power supply powered the first personal computers made by IBM. & the standard was adopted for other manufactures well. Specially, it powered all AT & AT-Compatible motherboards.

The AT-compatible motherboard obtained it's power from a special two-part power connector from the AT power supply. This power connector contained four +5V DC wires. Four ground (0volt) wires, one +12volt wire and one I2 volt wire.

(ii) **ATX Power Supply:-** ATX (Advanced Technology Extended is a motherboard from factor specification developed by Intel in 1995 with advances in software and os. computers could do more such as "Power save" or "Sleep mode software could now be used to turn off the computer rather than having to turn off a computer with a power switch. This has all been made possible by use of ATX power supplies & ATX compatible mother boards. The ATX power supply, therefore is more complex An ATX power supply has more outputs that connect to an ATX-compatible motherboard. Whereas the AT power supply only had & outputs, the ATX power supply uses either 20 or 24 outputs. Most ATX power supplies takes

into account that an ATX motherboard can contain either 20 or 24 outputs, so the extra 4 outputs are often split out as a separate plug that will only fit one way into a 24 output motherboard connector. The ATX power supply also supports more voltage settings & is capable of accepting signals from the ATX-compatible, motherboard other than simply "Power Good". The 24-pin ATX power supply has the following numbers of outputs, all voltage. DC: three 3.3 volt, eight ground (0volt), five +5 volt, one 5 volt, two +12 volt, one -12 volt & four "Signal" wires ("Power Good", "+5 VSB", "+3.3 volt sense" & "power on").

The voltage produced by AT/ATX/ATX-2-power supplies are:

→ 3.3 volts DC (ATX/ATX-2)

→ +5volts DC CAT/ATX/ATX-2)

→ -5 volts DC (AT/ATX/ATX-2)

→ +5 volts De stand by (ATX/ATX-2)

→ +12 volts DC (AT/ATX/ATX-2)

→ -12 volts DC (AT/ATX/ATX-2)

Different types of connectors available in power Suppliers

. (a) 4pin Berg connector: Used to connect the Psu to small form factor devices, such as 3.5 "Floppy drives

Available in: AT, ATX & ATX-2.

(b) 4pin Molex Connector: This is used to power various components, including hard drives & optical drives.

Available in AT, ATX, ATX-2.

(C) 20pin Molex ATX power connector: This is used to power the motherboard in ATX systems.

Available in: ATX (ATX-2 have four extra pins)

(d) 4pin molex P4 12V power connector: Used specifically for pentium 4 processor Motherboards.

Available in: ATX (integrated into the power connector in ATX-2)

(e) 6pin Aux connector: Provides +5VDC & two connection of +3.3v.

Available in 3 ATX/ATX-2.

→ To check whether SMPS is working or not.

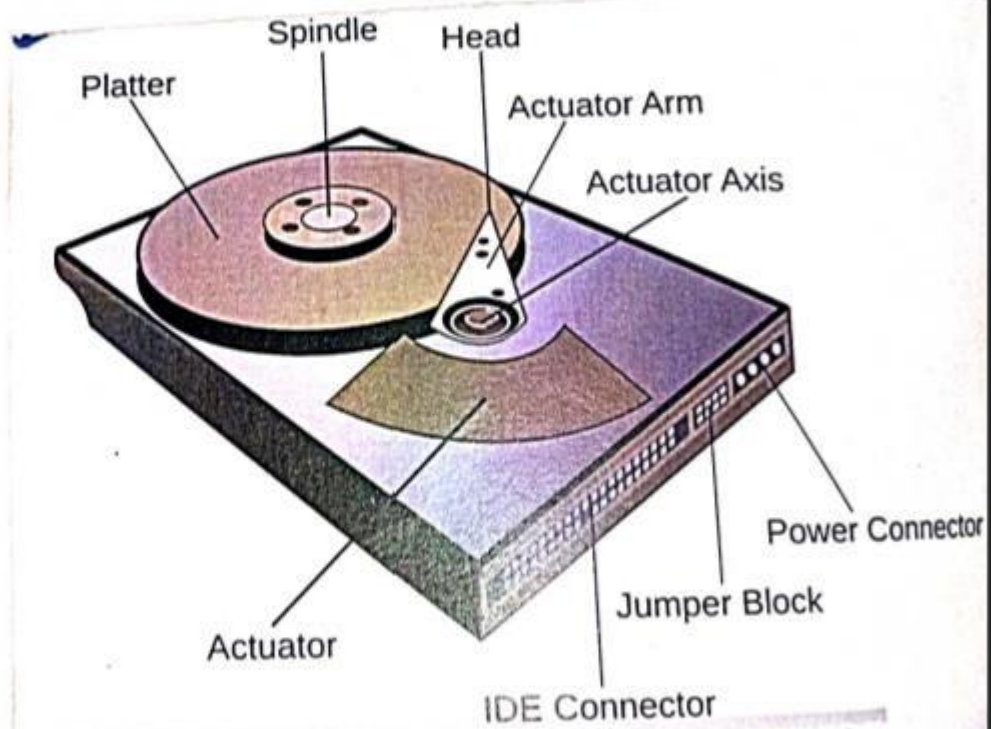
→ Take a small piece of wire & connect one in Green wire port & other in the Black Switch ON the supply if the fan in the SMPs is working the SMPS is good. If not open the cover &

check whether the capacitors inside the SMPS is bulged on the top. If bulged replace the capacitor same value of the earlier .

A good ATX SMPS wires give the following voltage as the output & work for different purposes.

CONCLUSION

We have the successfully studied the functioning of SMPS with output voltage & connectors.



EXPREMENT:- 05

AIM OF THE EXPRIMENT:-

To study the Hard disk drive (HHD) interfaces.

COMPONENTS REQUIRED:-

Different types of hard disk.

THEORY:-

Hard disk drive (HHD):-

- A hard disk drive also hard drive, hard disk or disk drive is a device for storing & retrieving digital information, primarily computer data.
- It consist of one or more rigid (hence "hard") rapidly rotating discs or cylinder (called platters) coated with magnetic material & with magnetic heads arranged to write data the surface & read it form them.
- The cylinder spins & the heads moving over them to perform the read write operation. It's like time around 5-8 years.
- Hard drives are classified as non-volatile, random access digital, magnetic, data storage devices .introduced by IBM In 1956.

Hard Disk Components:-

Platters: - a number of disks on which data is stored (the more disks, the greater the drives capacity). The 5.25" platter was used in earlier days. Now-a-days it is replaced by the 3.5". The 2.5", 16", 1 ½" & 1" platters are using in the laptop computers. Among this the platters are known as "Microdrive". The material by which a disk platter is manufactured is aluminum Glass or Glass ceramic compounds. To hold the data on the substrate, it must be coated with magnetic media like Iron oxide media or Thin Film media.

Tracks: - Each side of the platter surface is divided into so many concentric circles is called tracks. The track numbers start from 0. The outermost track is given track no 0 & next 1 & so on. The innermost track will have the highest no. In a modem hard disk will have thousands of tracks on each platter.

Sectors: - It is smallest addressable unit on a direct access storage device & can hold up to 512MB of data only. The storage capacity of the HDD will vary according to the number of sectors or tracks present in it.

Latency time: - Latency is the average time it takes for a sector to be available the heads have reached a track. It is a factor in disk read & writes performance. Decreasing the of access to data latency or file. Increases the speed.

Head:- To read & write data (The heads "fly" over the surface of a disk supported by a few molecules of air)

Actuator: - To moves the head over the disks.

Spindle Motor: - It is the main motor which rotates the platters of the hard disk. It is also called spindle motor because it is directly connected to the spindle on which the platters are connected. It rotates at speed of 3600 to 7200 RPM or more...

Logic Board: - All modern hard disks are made with an intelligent circuit board integrated into the hard disk unit. It contains the electronic components that control various sections of the hard disk... It also acts as an interface between the hard disk drive & the system.

IDE/SATA connectors: - Used to connect with motherboard when connecting more than one hard drive to a computer on the same IDE controller, we generally have to assign one as the primary (master) & one as the secondary (slave). We do this by changing *. the jumpers on the modes of Failure: Hard drives may fail in a number of ways Failure may be immediate & total progressive or limited. Data may be totally destroyed or partially or totally recoverable. Other failures which may be either progressive. Limited as are usually for outweighs the cost saved by continuing to use a drive which may be failing. Repeated but recoverable read or write errors, unusual noises, excessive & unusual heating & other abnormalities are warning signs. Some of the common failures seen are head crash, Bad sectors, striation, circuit failure etc.

RESULT:-

We have successfully studied different components of the hard disk drive.

ERXPREMENT:- 06

AIM OF THE EXPERIMENT:-

To study the connecting hardware components for assembly of computer."

COMPONENTS REQUIRED:-

- 1/** Cabinet
- 2/** Processor
- 3/** Motherboard (SATA capable)
- 4/** Power Supply
- 5/** RAM
- (Memory) **6/** Processor Fan
- 7/** Case Fan
- 8/**Optical drive (DVD R/W & SATA capable)
- 9/** Hard drive (SATA capable)
- 10/** SATA cable
- 11/** Assortment of case & drive screws.

PROCEDURE:

Step-1:- Open the computer case by removing the side panels. Find the screws that hold the side panels in place & remove them. The panel is removed by first sliding it back then dotting it away from the case.

Step-2:- Prepare the motherboard, we want to asserole the well-linked device, we should use Intel core 2 duo motherboard.

Step 3:- Mount the CPU in the socket of the motherboard. We must choose the correct CPU for our motherboard & install it according to its instructions be careful not to install the CPU in wrong. Not only would our computers not work, it could short circuit & damages our motherboard.

Step 4:- Connect the CPU cooler to the Motherboard

Step 5:- Then, set heat sink.

Step 6:- Attach the RAM modules in the corresponding slots. The motherboard should have rows of Slots that have 2 or 3 sections that are different lengths.

Step 7:-Open the case & mount the power supply. To which is M-ATX type. Make sure to connect all the connections to the drives & the motherboard.

Step 8:- Attach the motherboard back plate to the case & check the motherboard mount positions. The motherboard's instructions should tell the position of the motherboard.

Step 9:- Suitably position the motherboard in. the case.

Step 10:- Mount the hard disk & connect it to the power supply & the motherboard. These should be separate connections for the power supply & the motherboard. In SATA hard disk case, should remove the jumper

Step 11:- Connect the SATA connectors to the drives. & USB connectors & the case switch to the mother -board. The case & motherboard's instructions should tell where to connect the cables.

Step 12:- Connect the SMPS 20 or 24 pin ATX connector & the 4pin power supply control connector to the

Motherboard:-

Step 13:- Mount the DVD-drive. After connecting the ATA cable to the device, hook it up to the power supply.

Step 14:- Check all power & data cable connect property in motherboard.

Step 15:- Connect all devices like keyboard. Mouse. In CPU then connect power cord & start computer.

Step 16:- Finally, select a compatible On.

CONCLUSION:-

We have successfully studied the connecting hardware components for assembly of computer.

EXPERIMENT:- 07

AIM OF THE EXPERIMENT:-

To know & understand the features available in BIOS setup utility & common errors in POST (Power on self Test).

COMPONENTS REQUIRED:-

PC

THEORY:-

The BIOS setup program or CMOS setup program is the system configuration & setup program which runs from System BIOS. It is a menu driven program It enables us to configure the motherboard & chipset setting, data & time, passwords disk drives, Boot options & many other basic system setting The configuration done by BIOS setup utility are stored in a special CMOS RAM

Accessing the BIOS setup Utility:-

The BIOS setup utility can be activated only by pressing special key or key combinations during the POST. The correct key to press is displayed on screen during Post. The key or key combinations used by major BIOS vendors are:-

(i) AMT BIOS-Press F1 or Del during POST

(ii) Phoenix BIOS-Press F1 or F2 during POST

(iii) Award BIOS-Press Del or Ctrl+Alt+ Esc during POST

→ On newer Intel motherboard based PCs, Press F2 to enter BIOS setup program.

BIOS Setup Menu:-

→ A typical setup menu is shown in figure.

→ This menu includes main, Advanced, security, power boot & Exit.

Setting the BIOS Device Priority:-

→ using the boot menu in the BIOS setup utility, we can change the boot drive order.

1. Select boot menu by pressing left Arrow (←) or Right Arrow (→) boot menu is shown in figure B.
2. Select boot device priority item from boot menu by pressing up arrow (↑). Down Arrow (↓) & press Enter. Now current boot device Priority is displayed as in figure C.
3. To change boot device priority press (+) plus or - (minus).
4. Press F10 to save the changes made & exit from the BIOS setup program.

CONCLUSION:-

We successfully studied the BIOS setup & familiar with it.

EXPREMENT:- 08

AIM OF THE EXPERIMENT:

To study the install & configure a windows 7 Os

COMPONENTS REQUIRED:

Computer, DVD Drive, Bootable window 7(DVD/pen drive)

THEORY:

Install Windows 7

The steps for installation of windows 7 are: -

Step 1: Before inserting the DVD, we will have to enter BIOS CIn most cases by pressing DEL on system start up) & select your primary boot device DVD-ROM. Insert the window 7 installation Disc & start your computer. When prompted. From DVD", press a to "press. Key on the • any key too boot keyboard.

Step 2: The installation program will check our hardware, install default set drivers & load files. Necessary for installation. When arriving at the "Welcome to Setup" screen. Press ENTER to begin. the installation process.

Step 3: Now we will get the window setup window. This is a part to select language for our window. Select "English" & sext also there will be a click next 'INSTALL Now' button. Click on it & proceed to next step.

Step 4: Select language, country & keyboard & Click next.

Step 5: Click install now.

Step 6: Accept the license agreement by checking. the check box & click next button..

Step 7: If we want to upgrade already existing Os select upgrade. Click Custom option now.

Step 8: This is the important step. Here we can partition the hard disk & format the drive. If there is no partition in the hard disk, the window will be shown in right side. Click drive option to create or delete for make partitions.

Step 9: Create drives as required & select the drive we want to install windows 7 & click next.

Step 10: The installation process will start & take few minutes.

Step 11: Provide username. The computer will restart & will boot with the new Os

Step 12: Then, Window-7 desktop screen will appears.

CONCLUSION:

2 have successfully studied the installation we of window 7 configuration.

EXPERIMENT – 09

AIM OF THE EXPERIMENT:-

To study the install & configure a windows8.05.

COMPONENTS REQUIRED:-

Computer, Bootable window & pendrive.

THEORY:-

Install Window 8.

The Steps for installation of windows are:

Step 1: Before inserting the pendrive, we will have to enter Bios (In most cases by pressing DEL on system startup) & select your primary boot device removable device. Insert the window 8 installation Bootable & select F10 for saving the configuration & exit.

Step 2: The installation program will check our hardware install default set drivers & load files necessary for installation. When arriving at the "Welcome to setup" screen.

Step 3: Now we will get the windows setup window. This is the part of select language time & currency format keyboard layout, click Next.

Step 4: Click Install now

Step 5: Enter the product key of 25 characters which given with purchase copy of windows 8 & click next.

Step 6: Accept the license agreement by checking. the checkbox & click next button.

Step 7: If you want to upgrade already existing OS & select upgrade. If picking custom will allow you to do a complete installation of window 8 click on custom Install.

Step 8: This is the important step. Here we can partition the hard disk & format the drive. If there is no partition in the hard disk, the window will be shown in right side. Click drive options to create or delete for make partitions.

Step 9: Create drives as required & select the drive we want to install window & click next.

Step 10: The installation process will start & take few minutes. Then windows will automatically restart your computer when finished.

Step 11: After the computer reboots, you will see the windows 8 logo. Beneath it will be the text "Getting devices ready followed by a percentage. When this is done the text will change to "Getting ready". Your computer will restart one more time

Step 12: Once computer finishes rebooting, you will be asked to pick the color scheme & enter a computer name. After choosing all of your settings windows goes through one final setup process.

Step 13: Once the loading is complete, you will be presented to start screen.

Step 14: Then goto desktop & right click on the desktop & click personalize & change desktop icon... Select the desktop icon & save.

CONCLUSION:-

We have successfully studied the installation of windows 8 & configuration.

EXPERIMENT – 10

AIM OF THE EXPERIMENT:-

To study the install & configure a window 10 os.

COMPONENTS REQUIRED:-

Computer, Bootable window 10 (pendrive).

THEORY:-

Install Windows 10

The steps for installation of windows 10 are:

Step 1: Plug the USB device into your computer's USB port & start up the computer. Press F12 key to boot from USB.

Step 2: Choose your preferred language, time zone. currency & keyboard setting. Then click next.

Step 3: Click install now & select the windows 10 edition. Then Click next to start the installation process.

Step 4: If you want to upgrade already existing OS. Select upgrade. Click custom option now.

Step 5: This is the important step. Here we can partition the hard disk & format the drive. If there is no partition in the hard disk, the window will be shown in right side. Click drive options to create delete for make partitions.

Step 6: Now select the partition where you want to install windows & click next. The windows 10 installation will begin.

Step 7: After the installation is complete, computer will automatically restart one last time. Then choose your settings. If you want to sign in, you can sign in or you skip the step.

Step 8: Finally, windows 10 desktop screen will appears.

Configuration of window 10:-

Step 1: Select the start button & select settings> Personalization > Themes.

Step 2: Under themes > Related Settings> select desktop icon Settings.

Step 3: Choose the icons you would like to have on your desktop, then apply & OK.

CONCLUSION:

We have successfully studied the installation of windows 10 & configuration.

EXPERIMENT – 11

AIM OF THE EXPERIMENT:-

To study the installation of different application Software.

COMPONENTS REQUIRED:-

Computer, pendrive, Office 2007, Turbo C++ 4.0, Jdk-8u60, Textpad.

THEORY/PROCEDURE:-

Installation of office 2007:

Step 1: First. Double Click. Open the office 2007 folder.

Step 2: Then, go to setup & open it & enter product key.

Step 3: Then, Click continue & click install now.

Step 4: Then follows the prompts & installation finishes, then click close button.

Installation of Turbo C++4.0:

Step 1: Open the Turbo C++ folder. Then right click on the turbo C++ Setup.

Step 2: Select run as administrator.

Step 3: Then Click on next button.

Step 4: Accept the license agreement by checking the checkbox & Click Next.

Step 5: Then click on Install Now button.

Step 6: After installation finishes, Click on finish button.

Step 7: Right click on Turbo C++ 4.0 icon in the PC.

Step 8: finally, Turbo C++ 4.0 is opened & ready for coding.

Installation of Java Development Kit (Jdk-8u60):

Step 1: Open the Java folder, then right click on the jdk-8u60-windows-i586 folder & select open.

Step 2: Then right click on the Jdk-8u60-window-i586.

Step 3: Select Run as administrator.

Step 4: Then Click on Next button in setup dialog box.

Step 5: Then click Next in custom setup dialog box.

Step 6: Then you have select the destination folder

Step 7: Then installation of java will progress.

Step 8: After successfully installed of jdk. Then Click on close.

Installation Textpad:

Step 1: Open the textpad folder. Then right click on the Textpad setup.

Step 2: Select Run as administrator.

Step 3: Then click on next button in setup dialog box

Step 4: Accept the license agreement by checking the checkbox & click next.

Step 5: Enter the user name & details & click next.

Step 6: Then you have to select the destination folder & Click next.

Step 7: Then click on Install button.

CONCLUSION:-

We have successfully studied the installation of different application software.

EXPERIMENT – 12

AIM OF THE EXPERIMENT:-

To study the different Bios setup & different faults.

COMPONENTS:-

Computer

THEORY:

1. BIOS Error-Failed to Overclock:

The failed to overclock error screen show up whenever your BIOS setting have been cleared & usually has nothing to do with actually overclocking your system, unless you just tried to overclock your system. Some common occurrences which cause this error to arise are:

- Your system has been physically moved.
- Your CMOS battery is failing.
- Your System is having power issues.
- Overclocking your RAM or CPU.
- Adding a new device with is defective.

2. BIOS Error-failed Device:

Failed device is the second most common instance of bios error screen. This happens when a new flash drive, USB device or hard drive is connected to your PC. Most of the time adding a new flash drive or hard drive to your PC should not be an issue, Since all of the ports in our PCs tested throughly.

3. BIOS Emor CPU fan Error:

Many customers run into an error that tells them that CPU fan has an error. This is usually just because our silent fans spin slower than normal fans. We have designed our machines to be as quiet as possible & some of our designs having no moving parts in them at all.

BIOS Solutions:

CPU fan error Solution Seeing the CPU Fan error should prompt you to push the F1 key which in turn will load the BIOS Screen. You should make sure that all of the Fan sensors are turned off in a hardware monitor section by the manually turning the fan speed Sensors off. The easiest way to reset everything is to load from one of the profiles which we have preset in the BIOS this should set anything back to where we originally had it.

4. BIOS Error-Boot Device Error:

A boot device error is a common occurrence among modern motherboards. The DVD drive/hard drive may be set to boot as a UEFI (Unified Extensible Firmware

Interface) & may not always work. UEFI utilise the GPT partitions scheme & is for superior to that of the older MBR. UEFI is almost always the default on motherboards.

BIOS Solutions: Boot Device. Error Solution:

They are quite a few more options in the boot menu of a modern motherboard than but of an old generation motherboard. Scrolling down on the Boot page will list the primary DVD & hard drives boot options.

- Login into the BIOS by hitting the delete key / F2.
- Hit the F7 key to access the advanced view mode, if applicable.
- Navigate to boot menu & scroll down until you see the boot options, as well as the primary hard drive & DVD drive options.

CONCLUSION:-

We have successfully studied the different. BIOS setup & different faults.

EXPERIMENT – 13

AIM OF THE EXPERIMENT:-

To study the troubleshooting in Desktop & laptop.

COMPONENTS REQUIRED:-

Computer, Laptop, Power cord, RAM, SMPS, HDD, Data cable, CMOs Battery.

THEORY:-

Common PC Problems & How to troubleshoot them:

1. Power button will not start computer:

- i. If your computer does not start, begin by check the power cord to confirm that it is plugged securely into the back of the computer case & the power outlet.
- ii. If it is plugged into an outlet, make sure it is a working outlet. To check your outlet can plug in another electric device such as a lamp.

2. An application is running slowly:

- i. Close & reopen the application.
- ii. Update the application. To do this, Click the help menu & look for an option to check for updates. If you don't find this option, another idea is to run an online search for application.

3. All Programs on the computer run slowly:

- i. Run a virus scanner. You may have malware running in the background that is slowly things down.
- ii. If you are using a PC, you can run disk defragmenter

4. The mouse or keyboard stop working:

- i. If you are using a wired mouse or keyboard, make sure its correctly plugged into the computer
- ii. If you are using a wireless mouse or keyboard, make sure it's turned on & that batteries are charged.

5. The Screen is blank:

- i. The computer may be in sleep mode. Click the mouse or press any key on the keyboard to wake it.
- ii. Make sure the monitor is plugged in & turned on

6. The Sound isn't working:

- i. Check the volume level. Click the audio button in top-right or bottom-right corner of the screen to make sure the sound is turned on & that volume is up

- ii. Connected headphones to the computers to find out if you can hear sound through the headphone.

7. Window does not start successfully displays a blue screen:

- i. When you turn on the computer, press the F8 key in your keyboard repeatedly until you get a windows startup menu. Choose to start windows in safe mode. If windows boots up & you can login, restart windows & let it boot as normal which may resolve the problem.

8. PC Fans not working:

If you notice one or more fans in your PC aren't working, then it could be due to the dirt inside. You will have to open up the PC & use a compressor air can or a deaf blower to clean up the fans & other components.

9. Noisy hard drive:

If we hear clicking sound from the hard drive then it might be time to get a new one. Hard drives have a limited lifespan & loud sounds are the main sign of a near hard drive failure.

10. Blue Screen of Death:

The dreaded Blue screen of Death (BSOD) can occur due to both software & hardware problems. but usually it's a hardware problem. Whatever the cause, BSOD requires immediate attention.

Common Laptop problems & How to troubleshoot them:-

1. Laptop doesn't turn on:

We press the power button & nothing happens one common laptop problem is a complete failure for the device to turn on & it can leave you without access to our important files & programs.

2. The Screen is blank:

If your laptop shows signs that it is on such as lights or sounds but the screen remains blank, you are left unable to use your computer.

3. Laptop turns on & off respectively:

You may power on your laptop only for it to turn off & its own. The laptop may shutdown completely or you could be left with flickering display that makes it impossible to see the screen.

4. Laptop Shutdown or freezes:

You get on your computer & start working, only for it to freeze a few minutes later or shutdown on its own.

5. The battery does not charge properly:

If your laptop does not charge properly or at possible easy fix. Adjust your Ac adapter plug by moving the cord slightly to after the position in the power connector.

6. Screen light Falls:

Dimscreen lights can cause you to strain your eyes as you attempt to view your laptop screen. If everything else works on your laptop, you may be experiencing a screen inverter or backlight lamp failure.

7. Repetitive beep sound on starting:

When we power on our laptop, we expect the typical startup noises. If we are met with repetitive beeping Sound & a blank screen, try pressing your keyboard.

CONCLUSION:-

We have successfully studied the trouble Shooting in Desktop & Laptop