A Laboratory Manual for

Workshop Practice (WPC) (Computer Group)

(22005)

Semester- I

Diploma in Computer Engineering Group

(CM /IF)

BharatiVidyapeeth Institute of Technology

Navi Mumbai

BharatiVidyapeeth Institute of Technology

Navi Mumbai

Certificate

This is to certify that, Mr./ Ms. ……..…….

Roll No. …… of first Semester of Diploma in ……. ……. of Bharati Vidyapeeth Institute of Technology Navi Mumbai(Inst.code: ……..) has satisfactory completed the term work in the subject Workshop Practice (Computer Group- for the academic year 20…. to 20…. as prescribed in the MSBTE curriculum.

Place: ……... **Enrollment No. : ……**

Date:……Exam. Seat No. : …….

Sign:

Name:

Subject Teacher **Head of the Department** **Principal**

Seal of Institution

LIST OF EXPERIMENT AND PROGRESSIVE ASSESSMENT FOR TERM WORK (TW)

Academic Year:……..Name of faculty:……..……..…
Course &Code:……subject & Code:……..……..…
Name …..……..…..…….
Enrollment no……..Roll no:…….…….
semester:…….Marks:…….. Max:……Min: ……..…...….

S. No.	Practical Exercises	Group size for Expt.	Page No.	Date of performance	Date of submission	*assessment Marks(10)	Sign. Of & remark
1	Use devices: Pliers, nose pliers, cutter, screw driver.	4-5 students					
2	Use devices: tester, test lamp of different sizes	4-5 students					
3	Use measuring instruments: ammeter, voltmeter, wattmeter	4-5 students					
4	Use measuring instruments: clip on meter, multimeter, Megger	4-5 students					
5	Identify different types of: resistors, inductors, capacitors, potentiometers, Thermistor, Transformer, auto transformer from the given components	4-5 students					
6	Identify the terminals of the following components: Diode, Zener diode, Varactor diode, LED, Photo diode, BJT**,** Photo transistor, FET, LDR, Solar cell, Photocell, Opto-coupler,7 Segment Display, Relays	4-5 students					
7	Perform soldering and de -soldering operations	4-5 students					
8	Connect UPS with mains and batteries	4-5 students					
9	Connect batteries of battery bank	4-5 students					
10	Open PC Panel and Identify Components (Part-I)	4-5 students					
11	Open PC Panel and Identify Components (Part-II)	4-5 students					
12	Clean inside PC - Boards and Slots (Part-I)	4-5 students					
13	Clean inside PC - Boards and Slots (Part-II)	4-5 students					

14	Connect power socket and controller socket to disk drives and motherboard. (Part-I)	4-5 students					
15	Connect power socket and controller socket to disk drives and motherboard. (Part- II)	4-5 students					
16	Connect/disconnect LAN Cable, External Hard disk, Modem	4-5 students					
17	Connect desktop computer and laptop with LCD/DLP Projector	4-5 students					
18	Clean Keyboard and fitting it to computer	4-5 students					
19	Connect different types of mouse to ports	4-5 students					
20	Install and work with Dot matrix printer	4-5 students					
21	Work with Dot matrix printer settings (various types of buttons and their functions, changing ribbon cartridge, paper fitting, eject)	4-5 students					
22	Install and work with laser printer (various types of configuration settings on printer, removing and mounting cartridge, troubleshooting paper jam)	4-5 students					
23	Install and work with scanner with default settings	4-5 students					
24	Change scans settings, scanning documents/images and saving in different formats.	4-5 students					
25	Connect Modem, Hub/Switches/routers physically.	4-5 students					
26	Prepare and test crossover and straight cable, CAT5,CAT6 Cable, using Crimping tools, Splicer	4-5 students					
27	Connect two Switches/Hubs using normal and uplink port	4-5 students					
28	Write on CD/DVD, single session/multisession	4-5 students					
29	Identify fiber optic cable construction and connectivity	4-5 students					
30	Identify Wi-Fi environment and its setup	4-5 students					
31	Identify wired network environment and its setup	4-5 students					
32	Identify blue tooth based wireless mouse, keyboard and other devices	4-5 students					
	Total						

*To be transferred to Performa of CIAAN-2011
(Performa D-4) **Assessment Parameters.**

Cognitive(4 M)	Psychomotor(4 M)	Affective(2 M)	Total(10 M)

Signature of Student Signature of Faculty

Experiment no: 01

Title:

Use devices: Pliers, nose pliers, cutter, screw driver

Prior concepts:

Observed peripheral devices in computer in the lab.

Proposition 1: Pliers

Pliers are a hand tool used to hold objects firmly, possibly developed from tongs used to handle hot metal in Bronze Age Europe. They are also useful for bending and compressing a wide range of materials. Generally, pliers consist of a pair of metal first-class levers joined at a fulcrum positioned closer to one end of the levers, creating short jaws on one side of the fulcrum, and longer handles on the other side. This arrangement creates a mechanical advantage, allowing the force of the hand's grip to be amplified and focused on an object with precision. The jaws can also be used to manipulate objects too small or unwieldy to be manipulated with the fingers.

Proposition 2: Nose Pliers

Needle-nose pliers (also known as pointy-nose pliers, long-nose pliers, pinch-nose pliers or snipe-nose pliers) are both cutting and holding pliers used by artisans, jewellery designers, electricians, network engineers and other tradesmen to bend, re-position and snip wire. Their namesake long nose gives excellent control while the cutting edge near the pliers' joint provides "one-tool" convenience. Because of their long shape they are useful for reaching into small areas where cables or other materials have become stuck or unreachable with fingers or other means

Proposition 3: Cutter

A simple manual wire stripper is a pair of opposing blades much like scissors or wire cutters. The addition of a center notch makes it easier to cut the insulation without cutting the wire.

Proposition 4: Screw Driver

A **screwdriver** is a tool, manual or powered, for turning (driving or removing) screws. A typical simple screwdriver has a handle and a shaft, and a tip that the user inserts into the screw head to turn it. The shaft is usually made of tough steel to resist bending or twisting.

Learning objectives:

Intellectual skills:

Observe the all devices in the lab.

Motor skills:

1. Ability to check and know the devices which are used for computer.
2. And know the working process of each and every device.

Conclusion:

1. Pliers means……
2. Screw Driver:……..……..

Question:

1. What are the Pliers devices?
2. What are observe in the lab?

3. What is the use of a screwdriver?

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

Experiment No.2

Title:

Use devices: tester, test lamp of different sizes

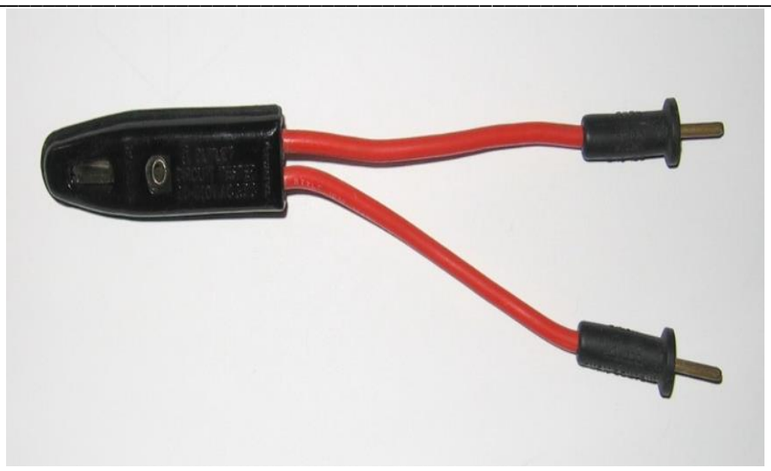
Prior Concepts:

Introduction to tester, test lamp of different sizes.

New concepts:

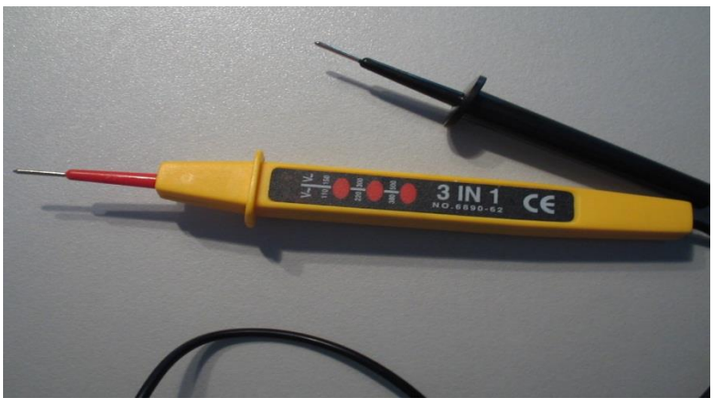
Proposition 1: Test Lamp:

A **test light**, **test lamp**, **voltage tester**, or **mains tester** is a simple piece of equipment used to determine the presence or absence of an electric voltage (usually alternating current (AC)) in a piece of equipment under test.



- **Two-contact test lights:**

The test light is an electric lamp connected with one or two insulated wire leads. Often, it takes the form of a screwdriver with the lamp connected between the tip of the screwdriver and a single lead that projects out the back of the screwdriver.



- **One-contact neon test lights:**

A low-cost type of test lamp only contacts one side of the circuit under test, and relies on stray capacitance and current passing through the user's body to complete the circuit.

Learning objectives:

Intellectual skills:

1. Understand Tester
2. Understand test lamp devices

Motor skills:

1. Ability to use tester and test lamp devices.

Conclusion:

A test light, test lamp, voltage tester, or mains tester is a simple piece of equipment used to determine the presence or absence of ……. in a piece of equipment under test.

Questions:

1. Tester used for_____
2. Test lamp used for _____

C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

Experiment No.3

Title:

Use measuring instruments: ammeter, voltmeter, wattmeter

Prior Concepts:

Introduction to measuring instruments.

New concepts:

Proposition 1: Ammeter

An ammeter (from Ampere Meter) is a measuring instrument used to measure the current in a circuit. Electric currents are measured in amperes (A), hence the name. Instruments used to measure smaller currents, in the milliampere or microampere range, are designated as *milliammeters* or *microammeters*. Early ammeters were laboratory instruments which relied on the Earth's magnetic field for operation. By the late 19th century, improved instruments were designed which could be mounted in any position and allowed accurate measurements in electric power systems.

The relation between electric current, magnetic fields and physical forces was first noted by Hans Christian Ørsted who, in 1820, observed a compass needle was deflected from pointing North when a current flowed in an adjacent wire. The tangent galvanometer was used to measure currents using this effect, where the restoring force returning the pointer to the zero position was provided by the Earth's magnetic field. This made these instruments usable only when aligned with the Earth's field. Sensitivity of the instrument was increased by using additional turns of wire to multiply the effect – the instruments were called "multipliers"

Proposition 2: Voltmeter

A **voltmeter** is an instrument used for measuring electrical potential difference between two points in an electric circuit. Analog voltmeters move a pointer across a scale in proportion to the voltage of the circuit; digital voltmeters give a numerical display of voltage by use of an analog to digital converter. A voltmeter in a circuit diagram is represented by the letter *V* in a circle.

Voltmeters are made in a wide range of styles. Instruments permanently mounted in a panel are used to monitor generators or other fixed apparatus. Portable instruments, usually equipped to also measure current and resistance in the form of a multimeter, are standard test instruments used in electrical and electronics work. Any measurement that can be converted to a voltage can be displayed on a meter that is suitably calibrated; for example, pressure, temperature, flow or level in a chemical process plant.

Proposition 2: Wattmeter

The **wattmeter** is an instrument for measuring the electric power (or the supply rate of electrical energy) in watts of any given circuit. Electromagnetic wattmeter's are used for measurement of utility frequency and audio frequency power; other types are required for radio frequency measurements.

Learning objectives:

Intellectual skills:

1. Understand the ammeter.
2. Understand the Voltmeter.
3. Understand Wattmeter

Motor skills:

1. Ability to connect and use different types of measuring instruments.

Conclusion:

- An ammeter is a measuring instrument used to measure the……..(current/voltage) in a circuit
- An voltmeter is a measuring instrument used to measure the……..(current/voltage) in a circuit
- The……. (ammeter**,** wattmeter) is an instrument for measuring the in watts of any given circuit..

Questions:

1. By using web write brief history of measuring instruments.
(space for answers)

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

Experiment No: 04

Title:

Use measuring instruments: clamp meter, multimeter,Megohmmeter

Prior concepts:

Use measuring instruments to chaeck the different devices

Proposition 1: Clamp Meter

An electrical meter with integral AC current clamp is known as a clamp meter, clamp-on ammeter or tong tester. A clamp meter measures the vector sum of the currents flowing in all the conductors passing through the probe, which depends on the phase relationship of the currents. Only one conductor is normally passed through the probe. In particular if the clamp is closed around a two-conductor cable carrying power to equipment, the same current flows down one conductor and up the other; the meter correctly reads a net current of zero. As electrical cables for equipment have both insulated conductors (and possibly an earth wire) bonded together, clamp meters are often used with what is essentially a short extension cord with the two conductors separated, so that the clamp can be placed around only one conductor of this extension.

A relatively recent development was a multi-conductor clamp meter with several sensor coils around the jaws of the clamp. This could be clamped around standard two- or three-conductor single-phase cables to provide a readout of the current flowing through the load, with no need to separate the conductors.

Proposition2: Multimeter:

A **multimeter** or a **multitester**, also known as a **VOM** (Volt-Ohm-Milliammeter), is an electronic measuring instrument that combines several measurement functions in one unit. A typical multimeter can measure voltage, current, and resistance. **Analog multimeters** use a microammeter with a moving pointer to display readings. **Digital multimeters** (DMM, DVOM) have a numeric display, and may also show a graphical bar representing the measured value. Digital multimeters are now far more common due to their cost and precision, but analog multimeters are still preferable in some cases, for example when monitoring a rapidly varying value.

A multimeter can be a hand-held device useful for basic fault finding and field service work, or a bench instrument which can measure to a very high degree of accuracy. They can be

used to troubleshoot electrical problems in a wide array of industrial and household devices such as electronic equipment, motor controls, domestic appliances, power supplies, and wiring systems.

Proposition2: Megohmmeter

Megohmmeter (sometimes referred to as a megger) is a special type of ohmmeter used to measure the electrical resistance of insulators. Insulating components, for example cable jackets, must be tested for their insulation strength at the time of commissioning and as part of maintenance of high voltage electrical equipment and installations.

For this purpose megohmmeters, which can provide high DC voltages (typically in ranges from 500 V to 5 kV, some are up to 15 kV) at specified current capacity, are used. Acceptable insulator resistance values are typically 1 to 10 megohms, depending on the standards referenced.

Learning objectives:

Intellectual skills:

1. Understand and measure the different electronic circuit using clamp meter, multimeter,Megohmmeter

Motor skills:

1. Ability to use the Clamp meter, multimeter,Megohmmeter

Conclusion:

. A clamp meter measures the ……(vector/voltage) sum of the currents.

Question :

1. What is Multimeter?
2. What is use of Megohmmeter?
3. How will measures current by using clamp meter?

(space for answers)

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

EXPERIMENT NO: 5

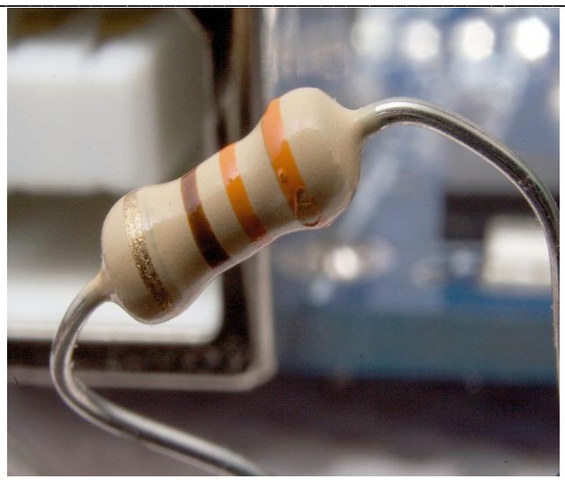
Title:

Identify different types of: resistors, inductors, capacitors, potentiometers, Transformer, auto transformer from the given components Write down the function of each switch.

Prior concepts:

Computer with good configuration, different types of printers, different printer settings, Functions of switch.

Proposition 1: **Resistors**

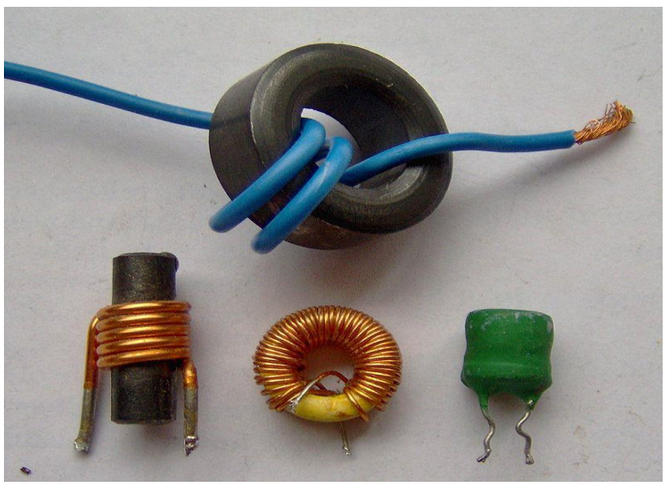


A **resistor** is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.

- **Fixed resistor:**
  Through-hole components typically have "leads" (pronounced /liːdz/) leaving the body "axially," that is, on a line parallel with the part's longest axis. Others have leads coming off their body "radially" instead. Other components may be SMT (surface mount technology), while high power resistors may have one of their leads designed into the heat sink
- **Variable Resistors:**
  A resistor may have one or more fixed tapping points so that the resistance can be changed by moving the connecting wires to different terminals. Some wirewound power resistors have a tapping point that can slide along the resistance element, allowing a larger or smaller part of the resistance to be used.

Proposition 2: Inductors

An inductor, also called a coil or reactor, is a passive two-terminal electrical component that stores electrical energy in a magnetic field when electric current is flowing through it.[1] An inductor typically consists of an electric conductor, such as a wire, that is wound into a coil. When the current flowing through an inductor changes, the time-varying magnetic field induces a voltage in the conductor, described by Faraday's law of induction. According to Lenz's law, the direction of induced electromotive force (*e.m.f.*) opposes the change in current that created it. As a result, inductors oppose any changes in current through them.



Proposition 3: Capacitors

A capacitor is a passive two-terminal electrical component that stores electrical energy in an electric field. The effect of a capacitor is known as capacitance. While capacitance exists between any two electrical conductors of a circuit in sufficiently close proximity, a capacitor is specifically designed to provide and enhance this effect for a variety of practical applications by consideration of size, shape, and positioning of closely spaced conductors, and the intervening dielectric material. A capacitor was therefore historically first known as an electric condenser.

Proposition 4: Capacitors

A potentiometer, informally a pot, is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider. If only two terminals are used, one end and the wiper, it acts as a variable resistor or rheostat.

The measuring instrument called a potentiometer is essentially a voltage divider used for measuring electric potential (voltage); the component is an implementation of the same principle, hence its name.

Potentiometers are commonly used to control electrical devices such as volume controls on audio equipment. Potentiometers operated by a mechanism can be used as position transducers, for example, in a joystick. Potentiometers are rarely used to directly control significant power (more than a watt), since the power dissipated in the potentiometer would be comparable to the power in the controlled load.

Proposition 4: Transformer

A transformer is an electrical device that transfers electrical energy between two or more circuits through electromagnetic induction. A varying current in one coil of the transformer produces a varying magnetic field, which in turn induces a voltage in a second coil. Power can be transferred between the two coils through the magnetic field, without a metallic connection between the two circuits. Faraday's law of induction discovered in 1831 described this effect. Transformers are used to increase or decrease the alternating voltages in electric power applications.

An autotransformer (sometimes called autostep down transformer) is an electrical transformer with only one winding. The "auto" (Greek for "self") prefix refers to the single coil acting alone and not to any kind of automatic mechanism. In an autotransformer, portions of the same winding act as both the primary and secondary sides of the transformer. In contrast, an ordinary transformer has separate primary and secondary windingswhich are not electrically connected.

Learning objectives:

- **Intellectual skills:**
  1. Identify types of resisters.
  2. Different inductors.
  3. Function of capacitors.

     .
- **Motor skills:**
  1. Ability to know the use of resister.
  2. Ability to use of inductor.
  3. Ability to use of capacitor.
  4. Ability to identify types of transformar.

Conclusion:

A resistor is a…… (passive/active) two-terminal component.

A……. (capacitor/transformer) is stores electrical energy.

QUESTIONS:

1. Write in brief types of: Resistor, Capacitor, Transformer.

(space for answers)

C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

EXPERIMENT NO.6

Title

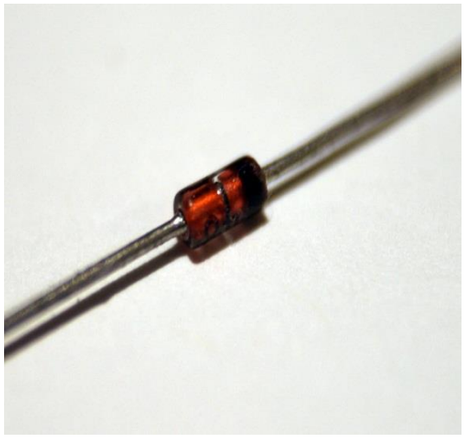
Identify the terminals of the components: Diode, Zener diode, Varactor diode, LED, Photo diode, BJT,photoresistor,7 Segment Display, Relays .

Prior concept

Diode, Zener diode.Varactor diode, LED, Photo diode, BJT, Photo transistor, FET, LDR, Solar cell, Photocell, Opto-coupler,7 Segment Display, Relays

New concepts:

Proposition 1: Zener diode

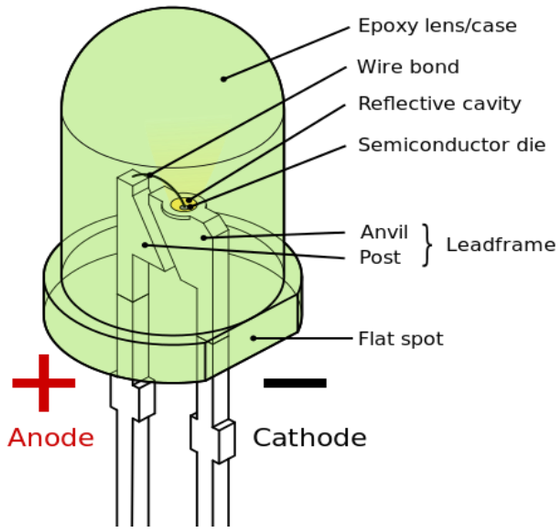


A **Zener diode** is a particular type of diode that, unlike a normal one, allows current to flow not only from its anode to its cathode, but also in the reverse direction, when the so-called "Zener voltage" is reached. Zener diodes have a highly doped p-n junction. Normal diodes will also break down with a reverse voltage but the voltage and sharpness of the knee are not as well defined as for a Zener diode. Also normal diodes are not designed to operate in the breakdown region, but Zener diodes can reliably operate in this region.

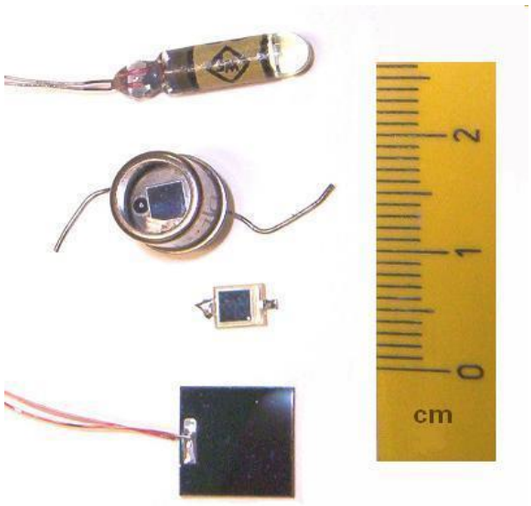
Proposition 2: LED

A light-emitting diode (LED) is a two-lead semiconductor light source. It is a p–n junction diode that emits light when activated.[5] When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence, and the color of the light (corresponding to the energy of the photon) is determined by the energy band gap of the semiconductor. LEDs are typically small (less than 1 mm^2) and integrated optical components may be used to shape the radiation pattern.

Early LEDs were often used as indicator lamps for electronic devices, replacing small incandescent bulbs. They were soon packaged into numeric readouts in the form of seven-segment displays and were commonly seen in digital clocks. Recent developments have produced LEDs suitable for environmental and task lighting. LEDs have led to new displays and sensors, while their high switching rates are useful in advanced communications technology



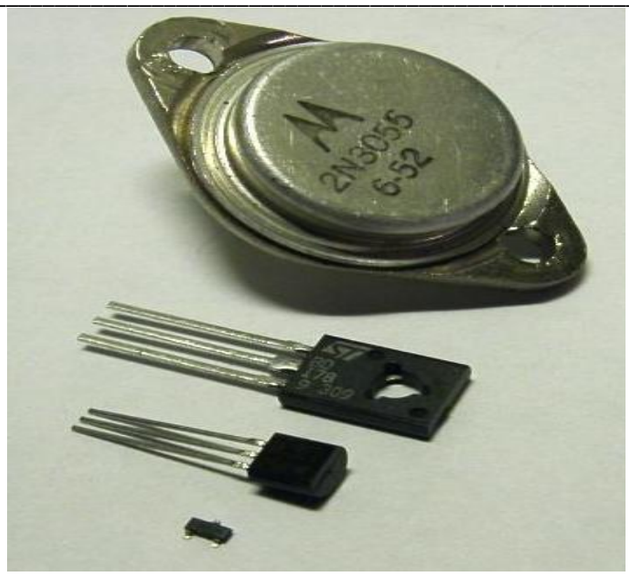
Proposition 3: Photo diode



A **photodiode** is a semiconductor device that converts light into an electrical current. The current is generated when photons are absorbed in the photodiode. A small amount of current is also produced when no light is present. Photodiodes may contain optical filters, built-in lenses, and may have large or small surface areas. Photodiodes usually have a slower response time as their surface area increases. The common, traditional solar cell used to generate electric solar power is a large area photodiode.

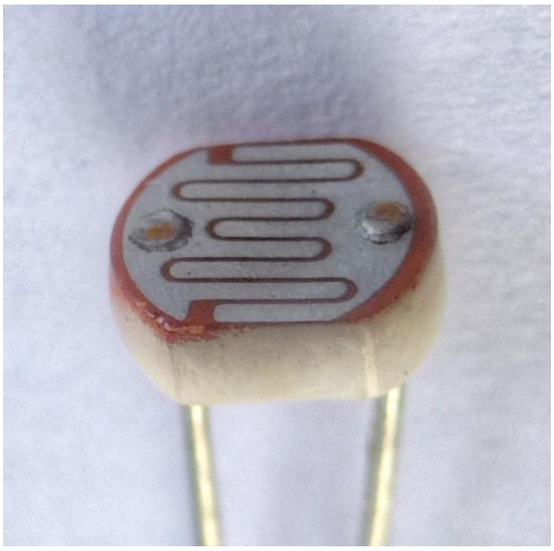
Proposition 4: Photo diode

A bipolar junction transistor (bipolar transistor or BJT) is a type of transistor that uses both electron and hole charge carriers. In contrast, unipolar transistors, such as field-effect transistors, only use one kind of charge carrier. For their operation, BJTs use two junctions between two semiconductor types, n-type and p-type.BJTs are manufactured in two types, NPN and PNP, and are available as individual components, or fabricated in integrated circuits, often in large numbers. The basic function of a BJT is to amplify current. This allows BJTs to be used as amplifiers or switches, giving them wide applicability in electronic equipment, including computers, televisions, mobile phones, audio amplifiers, industrial control, and radio transmitters.



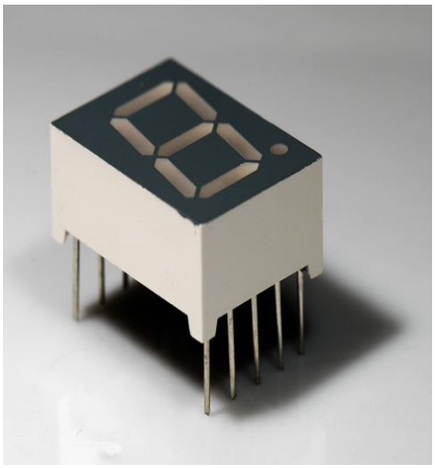
Proposition 5: Photoresistor

A photoresistor (or light-dependent resistor, LDR, or photoconductivecell) is a light-controlled variable resistor. The resistance of a photoresistor decreases with increasing incident light intensity; in other words, it exhibits photoconductivity. A photoresistor can be applied in light-sensitive detector circuits, and light- and dark-activated switching circuits. A photoresistor is made of a high resistance semiconductor. In the dark, a photoresistor can have a resistance as high as several megohms (MΩ), while in the light, a photoresistor can have a resistance as low as a few hundred ohms. If incident light on a photoresistor exceeds a certain frequency, photons absorbed by the semiconductor give bound electrons enough energy to jump into the conduction band. The resulting free electrons (and their hole partners) conduct electricity, thereby lowering resistance. The resistance range and sensitivity of a photoresistor can substantially differ among dissimilar devices. Moreover, unique photoresistors may react substantially differently to photons within certain wavelength bands.

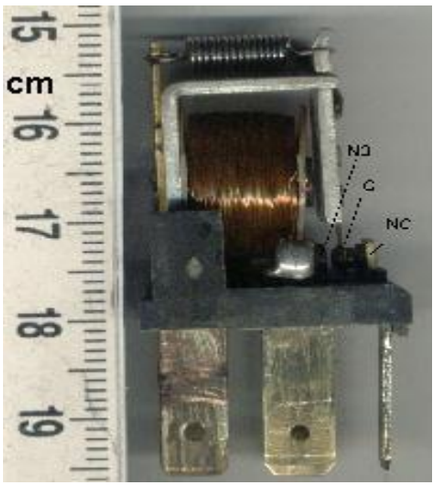


Proposition 6: Seven Segment Display

seven-segment display (SSD), or seven-segment indicator, is a form of electronic display device for displaying decimal numerals that is an alternative to the more complex dot matrix displays.Seven-segment displays are widely used in digital clocks, electronic meters, basic calculators, and other electronic devices that display numerical information



Proposition 7: Relays



A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.A type of relay that can handle the high power required to directly control an electric motor or other loads is called a contactor. Solid-state relays control power circuits with no moving parts, instead using a semiconductor device to perform switching. Relays with calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults; in modern electric power systems these functions are performed by digital instruments still called "protective relays".

Conclusion:

We Identify the……. components

Questions:

1) What is LED?
2) Define 7-segment display.

(space for answers)

C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

Experiment No: 7

Title: Perform soldering and de -soldering operations

Prior Concept Soldering Station

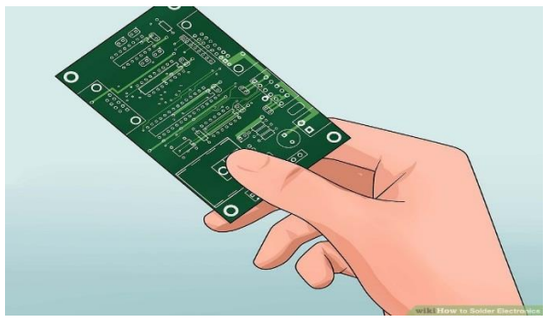
Proposition:Perform soldering and de -soldering operationsusing following steps

For soldering electrical components into printed circuit boards, the best soldering irons are Electrostatic Discharge (ESD) safe, temperature-controlled, high-power irons. These will let you solder for hours, and are good for complex amateur radio projects. For simple kits, an inexpensive pencil iron will do just fine.

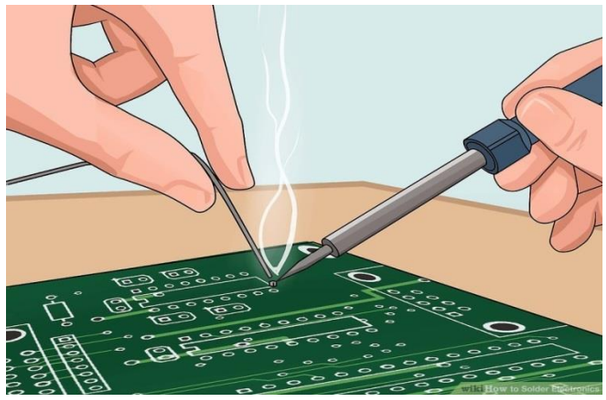
1. **Getting the Necessary Equipment:**

2. **Use a soldering iron with the appropriate heat control**

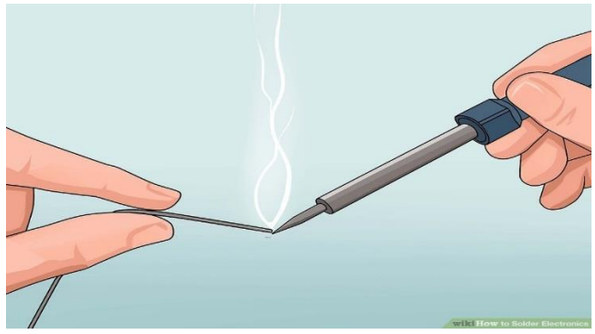
3. **Get the necessary board and components**



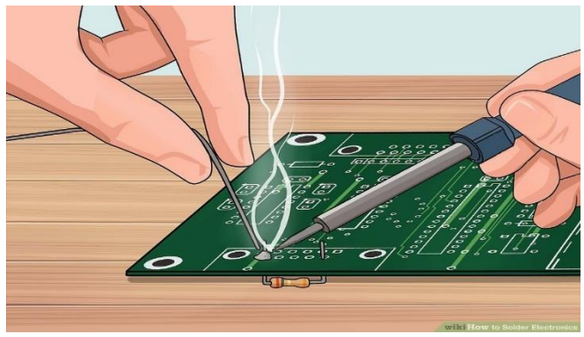
4. **Prepare the components for soldering and Be extremely careful and solder in an appropriate location.**



5. **"Tin" the solder.**



6. **Feed the solder onto the interface between the pad and lead**



7. **Keep the soldering iron clean.**

Learning objectives:

Intellectual skills:

Identify the soldering process

Motor skills:

1. Ability to connect the electronic component on motherboard

Conclusion:

For soldering electrical components into printed circuit boards an ……
…….will do just fine.

Question:

1. Write the detail steps for soldering

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

EXPERIMENT NO. 8

Title: Connect UPS with mains and batteries

Prior concept: Cables, UPS device, and power supply

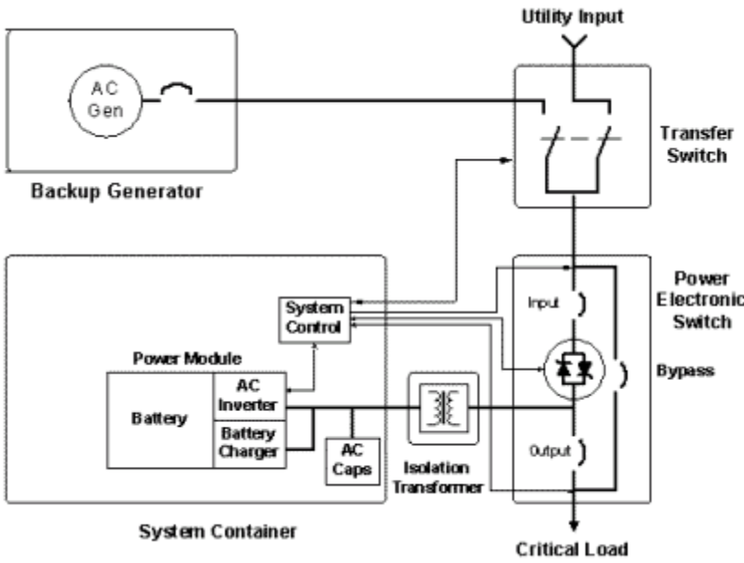
New concept:

Proposition 1:

Uninterruptible power supply

An uninterruptible power supply, also uninterruptible power source, UPS or battery/flywheel backup, is an electrical apparatus that provides emergency power to a load when the input power source or mains power fails. A UPS differs from an auxiliary or emergency power system or standby generator in that it will provide near-instantaneous protection from input power interruptions, by supplying energy stored in batteries, super capacitors, or flywheels. The on-battery runtime of most uninterruptible power sources is relatively short (only a few minutes) but sufficient to start a standby power source or properly shut down the protected equipment.

A UPS is typically used to protect hardware such as computers, data centers, telecommunication equipment or other electrical equipment where an unexpected power disruption could cause injuries, fatalities, serious business disruption or data loss. UPS units range in size from units designed to protect a single computer without a video monitor (around 200 volt-ampere rating) to large units powering entire data centers or buildings. The world's largest UPS, the 46-megawatt Battery Electric Storage System (BESS), in Fairbanks, Alaska, powers the entire city and nearby rural communities during outages



Differe nt types of UPS design:

The general categories of modern UPS systems are on-line, line-interactive or standby.

1. **A standby (off-line) UPS** system the load is powered directly by the input power and the backup power circuitry is only invoked when the utility power fails. Most UPS below 1 kVA are of the line-interactive or standby variety which are usually less expensive.
2. **A line-interactive UPS** maintains the inverter in line and redirects the battery's DC current path from the normal charging mode to supplying current when power is lost.
3. **A on-line UPS** uses a "double conversion" method of accepting AC input, rectifying to DC for passing through the rechargeable battery (or battery strings), then inverting back to 120V/240V AC for powering the protected equipment.

Learning objectives:

Intellectual skills:

Identify and understand UPS and connections

Motor skills:

Ability to understand different cablesand connection with main power supply.

Conclusion

UPS an electrical apparatus that provides emergency power to a load when the ……..

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QUESTION

1. Write short note on types of printer.

(space for answers)

C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

EXPERIMENT NO.9

Title: Connect batteries of battery bank

Prior concepts:

UPS, Power cables.

New concepts:

Proposition 1: Connect batteries of battery bank

Making larger battery packs is often required to extend backup time or increase voltage to make certain devices work. For example, if you own solar power system or Power inverter, you can connect several batteries to them to get more juice and more run time. Communication networks and small and large servers also use backup UPS which are circuited with often times large number of batteries or larger batteries. Different kind of packs are made depending upon needs and to cut maintenance costs.

Battery pack is also called as battery bank. Here, I have elaborately explained how to make Parallel, Series and Series-Parallel combined battery packs (battery banks). This guide is quite helpful for newbie users who want to learn how to connect batteries together while circuiting them with solar power systems, uninterruptible power supply (UPS) systems, power inverters or battery chargers. Additionally, I have also discussed some frequently asked questions related to the subject in FAQs section below.

BATTERIES IN SERIES AND PARALLEL CONNECTIONS (BATTERY PACKS)

Making larger battery packs is often required to extend backup time or increase voltage to make certain devices work. For example, if you own solar power system or Power inverter, you can connect several batteries to them to get more juice and more run time. Communication networks and small and large servers also use backup UPS which are circuited with often times large number of batteries or larger batteries. Different kind of packs are made depending upon needs and to cut maintenance costs.

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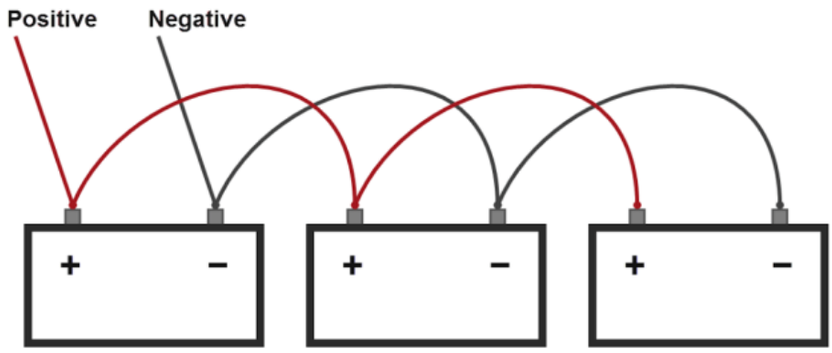
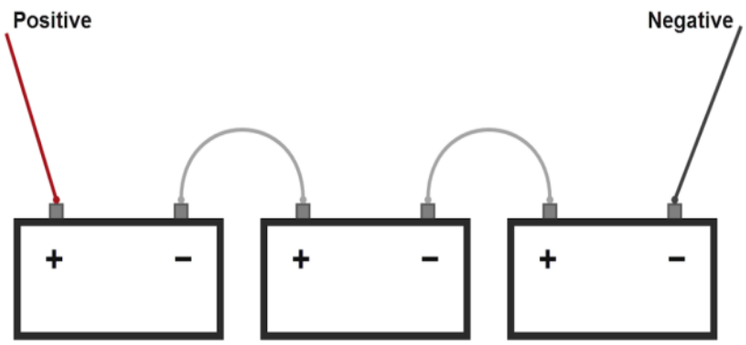
Batteries in Parallel Connection (Parallel Battery Pack)

In this type of battery bank, batteries are connected from terminals to same terminals of other batteries that is positive terminal (+) of one battery is connected with positive (+) terminal of other battery and negative terminal (-) of one battery with negative terminal (-) of other battery. See the diagram below for more idea:



Batteries in Series Connection (Series Battery Pack)

Batteries are connected from terminal to terminal in a way that positive (+) terminal of one battery is connected with negative (-) terminal of other battery and negative terminal (-) of one battery is connected with positive terminal (+) of other battery. See the diagram for more idea:



Learning objectives:

- **Intellectual skills:**
  1. Identify the connection between series of batteries
- **Motor skills:**

  1. Ability to connect the different batteries using different method

Conclusion:

1. Making larger battery packs is often required to extend backup time or increase …….to make certain devices work.

2. Battery pack is also called as……

Questions.

1. Write a procedure to clean the mouse.
2. Write a procedure to clean the keyboard.
3. Write a procedure to clean the motherboard.

Questions:

1. Write the battery coneection method in brief
(space for answers)

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EXPERIMENT NO.10

Title:

Open PC Panel and Identify Components (Part-I)

Prior Concepts:

Computer with good configuration.

New Concepts:

Preposition 1: RAM

Random-access memory (RAM /ræm/) is a form of computer data storage which stores frequently used program instructions to increase the general speed of a system. A random-access memory device allows data items to be read or written in almost the same amount of time irrespective of the physical location of data inside the memory. In contrast, with other direct-access data storage media such as hard disks, CD-RWs, DVD-RWs and the older drum memory, the time required to read and write data items varies significantly depending on their physical locations on the recording medium, due to mechanical limitations such as media rotation speeds and arm movement.

RAM contains multiplexing and demultiplexing circuitry, to connect the data lines to the addressed storage for reading or writing the entry. Usually more than one bit of storage is accessed by the same address, and RAM devices often have multiple data lines and are said to be '8-bit' or '16-bit' etc. devices.

Preposition 2: ROM

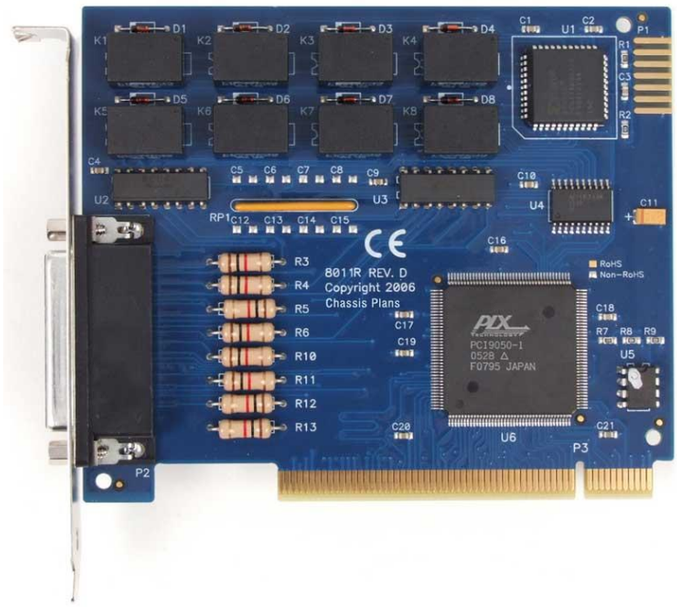
Read-only memory (ROM) is a type of non-volatile memory used in computers and other electronic devices. Data stored in ROM can only be modified slowly, with difficulty, or not at all, so it is mainly used to store firmware (software that is closely tied to specific hardware, and unlikely to need frequent updates) or application software in plug-in cartridges.

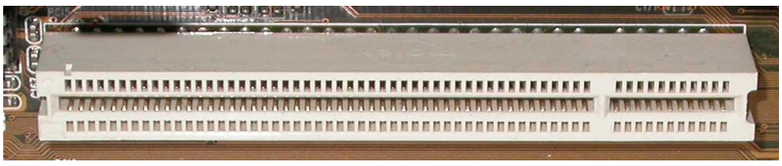
Strictly, read-only memory refers to memory that is hard-wired, such as diode matrix and the later mask ROM (MROM), which cannot be changed after manufacture. Although discrete circuits can be altered in principle, integrated circuits (ICs) cannot, and are useless if the data

is bad or requires an update. That such memory can never be changed is a disadvantage in many applications, as bugs and security issues cannot be fixed, and new features cannot be added

Preposition 3: Add-on Card:

In computing, the expansion card, expansion board, adapter card or accessory card, is a printed circuit board that can be inserted into an electrical connector, or expansion slot on a computermotherboard, backplane or riser card to add functionality to a computer system via the expansion bus.





An expansion bus is a computer bus which moves information between the internal hardware of a computer system (including the CPU and RAM) and peripheral devices. It is a collection of wires and protocols that allows for the expansion of a computer

Learning objectives:

Intellectual skills:

1. Understand the RAM
2. Understanding the ROM
3. Understanding the concepts Add-On Card

Motor Skills:

1. Ability to fix RAM
2. Ability to connect ROM
3. Ability to fix the card in expansion slot

Questions for confirmations of learning

1. Explain RAM

2. Define ROM
3. Write basic steps for fitting card in expansion slot

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EXPERIMENT NO: 11

Title:

Open PC Panel and Identify Components (Part-II)

Prior concepts:

HDD, DVD, Flash Memory, Pen drive

New concepts:

Proposition1: HDD

A hard disk drive (HDD), hard disk, hard drive or fixed disk is a data storage device that uses magnetic storage to store and retrieve digital information using one or more rigid rapidly rotating disks (platters) coated with magnetic material. The platters are paired with magnetic heads, usually arranged on a moving actuator arm, which read and write data to the platter surfaces. Data is accessed in a random-access manner, meaning that individual blocks of data can be stored or retrieved in any order and not only sequentially. HDDs are a type of non-volatile storage, retaining stored data even when powered off

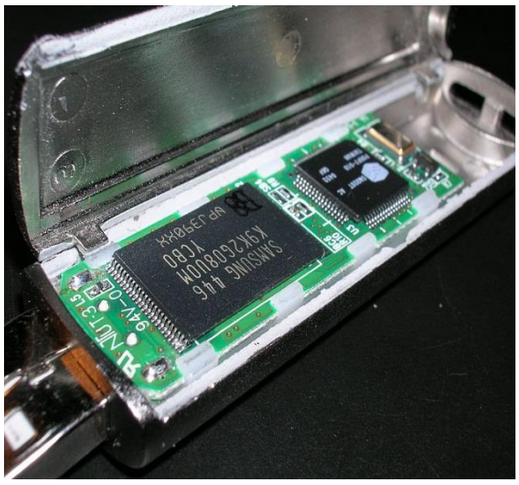
The two most common form factors for modern HDDs are 3.5-inch, for desktop computers, and 2.5-inch, primarily for laptops. HDDs are connected to systems by standard interface cables such as PATA (Parallel ATA), SATA (Serial ATA), USB or SAS (Serial attached SCSI) cables.

Proposition 2: DVD

DVD (an abbreviation of "digital versatile disc"[4][5] or "digital video disc"[6]) is a digital optical discstorage format invented and developed by Panasonic, Philips, Sony and Toshiba in 1995. The medium can store any kind of digital data and is widely used for software and other computer files as well as video programs watched using DVD players. DVDs offer higher storage capacity than compact discs while having the same dimensions.

DVDs are used in DVD-Video consumer digital video format and in DVD-Audio consumer digital audio format as well as for authoring DVD discs written in a special AVCHD format to hold high definition material (often in conjunction with AVCHD format camcorders). DVDs containing other types of information may be referred to as DVD data discs.

Proposition 3: Flash Memory



Flash memory is electronic (solid-state) non-volatile computer storage medium that can be electrically erased and reprogrammed.

Toshiba developed flash memory from EEPROM (electrically erasable programmable read-only memory) in the early 1980s and introduced it to the market in 1984. The two main types of flash memory are named after the NAND and NOR logic gates. The individual flash memory cells exhibit internal characteristics similar to those of the corresponding gates.

Where EPROMs had to be completely erased before being rewritten, NAND-type flash memory may be written and read in blocks (or pages) which are generally much smaller than the entire device. NOR-type flash allows a single machine word (byte) to be written—to an erased location—or read independently.

Proposition 4: Pen drive

A USB flash drive, also variously known as a USB drive, USB stick, thumb drive, pen drive, jump drive, flash-drive or USB memory, is a data storage device that includes flash memory with an integrated USB interface. USB flash drives are typically removable and rewritable, and physically much smaller than an optical disc. Most weigh less than 30 grams

(1.1 oz). Since first appearing on the market in late 2000, as with virtually all computer memory devices, storage capacities have risen while prices have dropped.

As of March 2016, flash drives with anywhere from 8 to 256 GB are frequently sold, and less frequently 512 GB and 1 TB units.[2][3] Storage capacities as large as 2 TB are planned, with steady improvements in size and price per capacity expected.[4] Some allow up to 100,000 write/erase cycles, depending on the exact type of memory chip used, and have a 10-year shelf storage time.

USB flash drives are often used for the same purposes for which floppy disks or CDs were once used; i.e. for storage, data back-up and transfer of computer files. They are smaller, faster, have thousands of times more capacity, and are more durable and reliable because they have no moving parts. Additionally, they are immune to electromagnetic interference (unlike floppy disks), and are unharmed by surface scratches (unlike CDs). Until about 2005, most desktop and laptop computers were supplied with floppy disk drives in addition to USB ports, but floppy disk drives have become obsolete after widespread adoption of USB ports and the larger USB drive capacity compared to the 1.44 MB 3.5-inch floppy disk

Learning Objectives:

Intellectual skills:

- **Conclusion:**

1) SATA stands for _____ (Serial ATA/System ATA).
2) Pendrive is used for_____

- **Questions:**

1. Write short note on HDD
2. What is the use of flash drive

(space for answers)

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

EXPERIMENT NO. 12

Title: Clean inside PC - Boards and Slots (Part-I)

Prior Concepts:

Motherboard,

Cleaning Brush, Cleaning liquid

New concepts:

Proposition: Steps to Clean the Motherboard:

1. For general cleaning, remove the covering over the motherboard.

2. Next, there are two options for removing the loose dirt and dust. The first is to blow it off with a can of compressed air. The second is to vacuum it out with a vacuum cleaner or dust buster. If you choose to utilize the vacuum, keep the attachment several inches away from the small pieces and intricate workings on the motherboard to avoid any damage or removal of the small components.

3. The dust is caked on, use the soft brush to gently brush over the area to loosen it.

4. Follow this with either more compressed air or vacuum it away for removal.

5. If there are sticky substances or dirt that cannot be removed, you will have to use a liquid cleaner with GREAT care. Adding liquid to a motherboard is never a good idea and great caution should be taken not to cause any damage.

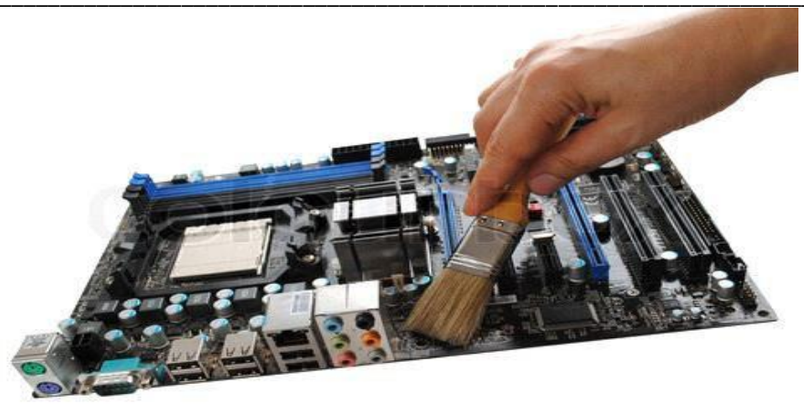
6. Moisten a cotton swab with rubbing alcohol and gently wipe away the sticky substance.

7. The alcohol will help to remove the dirt and evaporate quickly to lessen the chances of electrical damage.

8. Allow the motherboard to dry completely before reinstalling or powering the unit again.

9. Replace the cover onto the device.

Additional Tips and Ideas:-



Prior to using any liquid cleaners, ensure that all of the power has been turned off to the device. This is important for both your protection as well as to prevent damage to the motherboard.

If you have any doubts about your ability to clean the motherboard, do not hesitate to contact a professional or the manufacturer for further instructions.

Keep in mind that applying any liquids to the motherboard will likely void any warranty on the item.

Learning Objectives:

Identify the different components of motherboard and clean.

Conclusion:

The _____ will help to remove the dirt and evaporate quickly to lessen the chances of electrical damage in motherboard.(alcohol/water).

Questions:

1. List the procedure to clean the Motherboard

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Experiment No.13

Title:

Clean inside PC - Boards and Slots (Part-II)

Prior Concepts:

Motherboard, Cleaning Brush, Cleaning liquid**,** Screwdriver, Air Blower or Compressed Air, Tooth Brush, Isopropyl Alcohol 90%.

Proposition2: Basic cleaning

Step 1 – Power Off

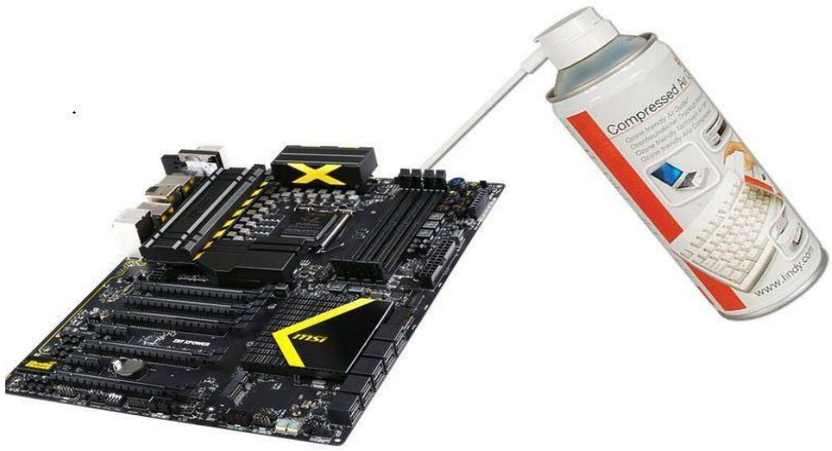
Turn off or shut down your computer if it's running. Unplug the main power cord from the back side which was attached to your computer's SMPS.

Step 2 – Disassemble

Now disassemble your computer and take off your motherboard from the computers cabinet.

Step 3 – Cleaning (Basic)

Now put your motherboard on a flat surface and remove the processor fan and the process also. Cover the process socket with a socket cover like in the picture given below.

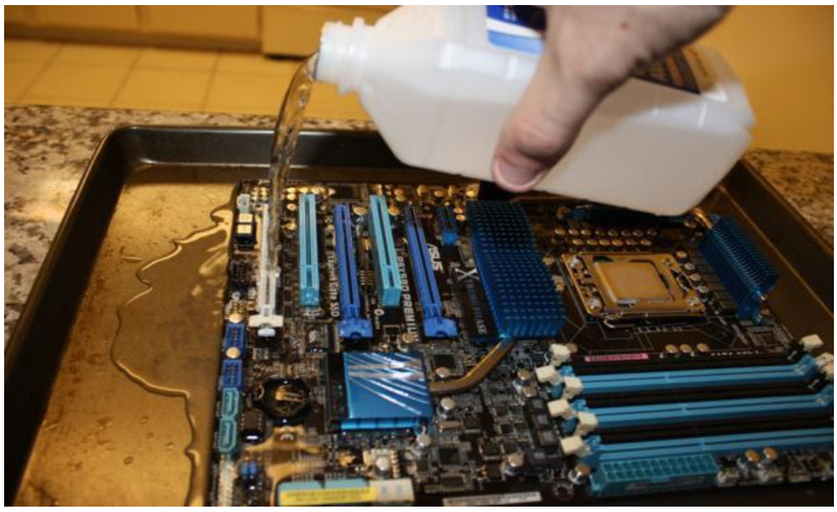


Now give an air pressure to the motherboard and that will remove all the dirt off to your board. After that clean the ram socket with the help of toothbrush and give an air pressure again into the socket. Now, the basic cleaning is done you can assemble back your motherboard into the computer case and power on your computer to test it.

Proposition2: Hard cleaning

Using isopropyl alcohol is very effective cleaner because its clean all the chemical dust-like carbon and the solder junks. Giving an alcohol bath to your motherboard is fully safe and it's also the common way to save a dead motherboard. Mostly all the repair shops also giving an alcohol bath to the motherboard for this cleaning process.

For hard cleaning, we are using isopropyl alcohol because it's non-conductive and it also dries fast. I'll suggest you to use 90% alcohol because 60-70 % contains more water than 90% and it's harmful to your computer and also creates an electric shorting.



Motor skills:

1. Ability to know how to clean Mothorboard

Conclusion:

Questions:

1. Write in brief basic and hard cleaning.

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Experiment No.14

Title:

Connect power socket and controller socket to disk drives and motherboard. (Part-I)

Prior Concepts:

Motherboard, PATA Hard disk, Data cables

New concepts:

Proposition 1: PATA Hard disk

Hard disks have passed through a long evolution of connectivity and data transfer standards. The drive interface standard from the 1980's was called the IDE (Integrated Drive Electronics) specification. Today it's usually called PATA (Parallel ATA). IDE includes sub-standards with names like EIDE, ATAPI, ATA, ATA-1, ATA-2, UDMA, ATA-4, ATA-133, and more. These sub-standards represent continuing improvement in data transfer speed and reliability.

Throughout this evolution, IDE's physical connectors have remained the same. So you could take an old 386 drive from 1988 and plop it into your Pentium 4 from 2005, and it would work! The IDE standards applied across thousands of different drive and motherboard manufacturers.

Here's how the IDE connector sockets on the motherboard look, along with the ribbon cable that goes from the motherboard socket into the back of any IDE drive. The third photo shows a close-up of an IDE drive power plug, the Molex 4-pin plug. It's white and it has a female connector that goes into the 4-pin male connector on the back of the disk drive. The final photo shows the back of an IDE disk drive. You can see where the IDE data ribbon cable plugs in to connect it to the motherboard and where the Molex power plug goes. Note the jumpers. You can connect either one or two IDE drives to an IDE ribbon cable. You set the jumpers to indicate whether one or two drives on are the same IDE cable, and which drive is where in the sequence. (Connecting SATA disk drives is simpler because they eliminate jumpers.)

Learning objectives:

Intellectual skills:

1. Understand the PATA Hard disk
2. Understand the Motherboard.

Motor skills:

1. Ability to connect PATA Hard disk to Motherboard.

Conclusion:

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Questions:

1. What is PATA Hard disk?
2. What is IDE?

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Experiment No.15

Title:

Connect power socket and controller socket to disk drives and motherboard. (Part-I)

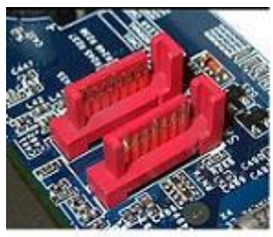
Prior Concepts:

Motherboard, SATA Hard disk, Data cables

New concepts:

Proposition 1: SATA Hard disk

SATA became popular with the introduction of dual core computers five or six years ago. SATAstands for Serial Advanced Technology Attachment. When it came out the IDE standards were retroactively renamed PATA or Parallel ATA to distinguish them from SATA or Serial ATA.
SATA advantages over the older PATA specs include faster data transfer, higher efficiency, hot plugging, reduced cable width, and better internal air flow. Like PATA, the SATA specs have evolved quickly to improve data transfer. SATA's physical connectors for consumer computers have remained the same throughout this evolution.
These photos show the SATA data cable sockets on the motherboard, the red SATA data cable and its end plugs, and the black SATA power plug:




The fourth photo shows the rear of an SATA disk drive. The red SATA data cable is plugged to connect to a SATA motherboard socket to support data transfer. To its right is the SATA power plug. SATA power plugs are by convention black plastic to distinguish them from the white plastic Molex plugs used on the older IDE/PATA drives.

Learning objectives:

Intellectual skills:

1. Understand the SATA Hard disk
2. Understand the Motherboard.

Motor skills:

1. Ability to connect SATA Hard disk to Motherboard.

Conclusion:

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Questions:

1. What is SATA Hard disk?

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Experiment No.16

Title:

Connect/disconnect LAN Cable, External Hard disk, Modem

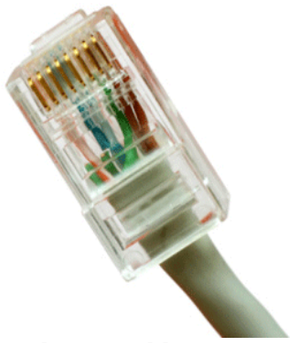
Prior Concepts:

LAN Cable, External Hard disk, Modem

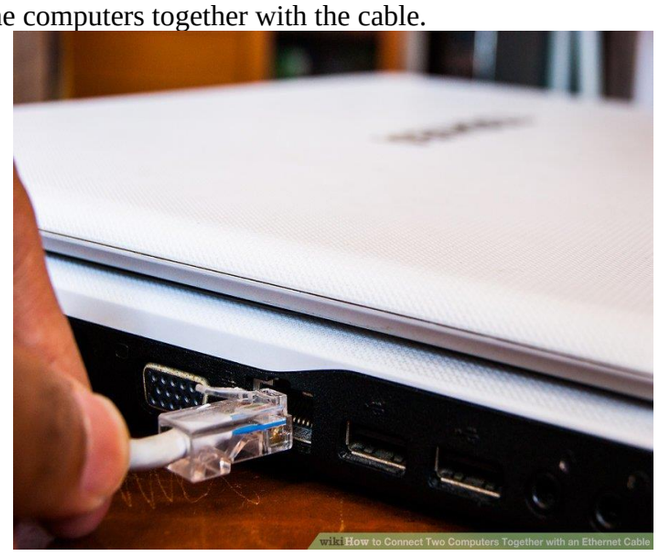
New concepts:

Proposition 1: LAN Cable

1. Verify that you have a crossover Ethernet cable A crossover Ethernet cable is required to connect computers with Windows OS; whereas a standard Ethernet cable will only establish a connection between a computer and router.



2. Plug each end of the Ethernet cable into an Ethernet network port on each computer to connect the computers together with the cable.

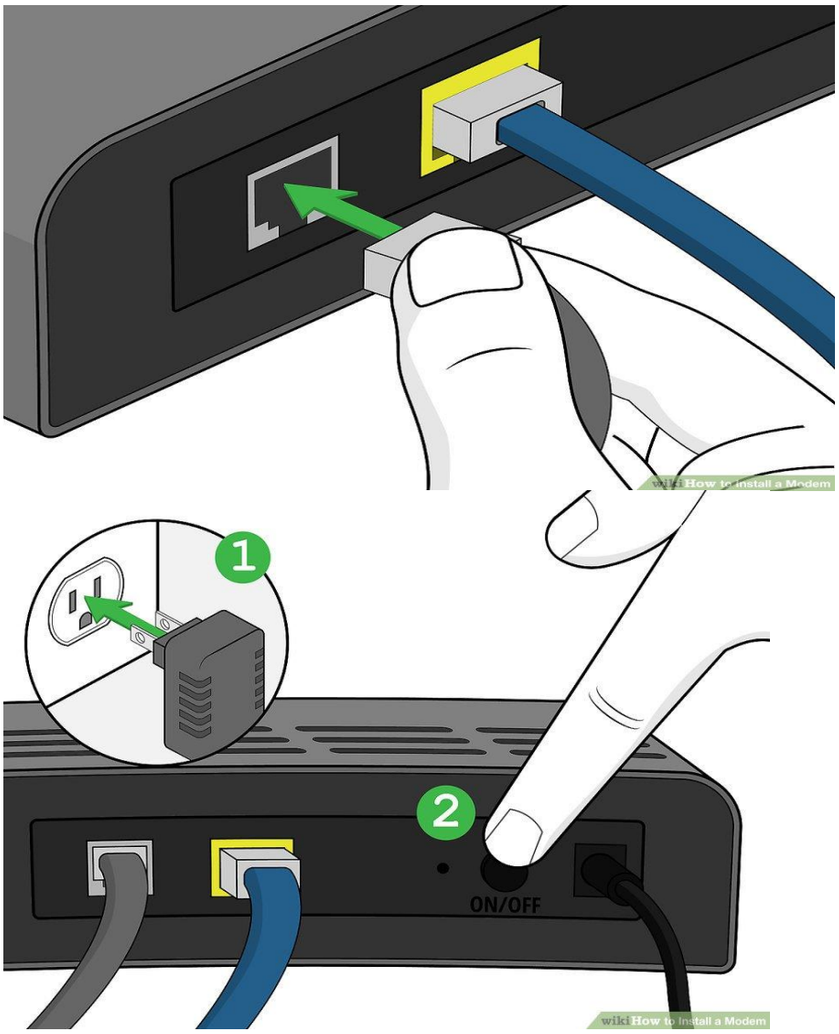


Proposition 2: External Hard disk

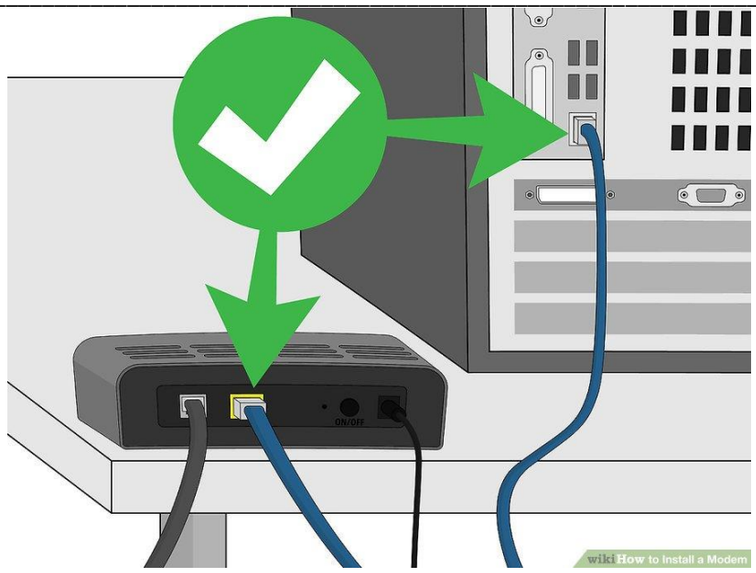
Plug the hard drive into the Mac using the cable that came with it. Most hard drives connect via USB, so you'll just need to plug the USB cable into an open port on your PC.

Proposition 3: Modem

1. Set the modem up. Place the modem in a location with good air circulation and away from other devices that may interfere with signals. Follow the instructions provided to connect the modem to the Cable or DSL line in your house. If you are using DSL, you will need to install filters first into a phone line.



2. Power the modem on. Once you've connected the modem to the service source, power it on by plugging it on and pressing the power button (if applicable). Wait a minute or two for the modem to boot up completely. The power light should be solid, while your connection light may be blinking because the modem hasn't been activated yet.



Learning objectives:

Intellectual skills:

1. Understand the LAN cable.
2. Understand the external hard disk.
3. Understand the connection of modem.

Motor skills:

1. Ability to connect LAN cable, External hard disk and modem.

Conclusion:

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Questions:

1. How to connect modem to network?
2. What is LAN cable connector?

(Space for answers)

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

Experiment no: 17

Title:

Connect desktop computer and laptop with LCD/DLP Projector

New concepts:

Connect desktop computer and laptop with LCD/DLP Projector

Proposition 1: Introduction

Projector

A **projector** is an output device that can take images generated by a computer or Blu-ray player and reproduce them onto a screen, wall, or other surface.

How to Connect a Projector to a PC

Step 1.Turning on the projector

1.Remove the projector and the power cable from the bag. Find the “AC In” port on the projector and put the correct end of the power cable in to it.

2.Plug the other end of the power cable into the wall outlet or power strip you will be using.

3.Make sure the power switch on the projector is in the correct position. The “Power” LED light will come on once you have completed these steps.

Step 2. Connecting the Laptop to the Projector

1. Find the VGA cable located in the projector bag.

2. Locate the “RGB In” or VGA In” port on the projector and connect one end of the VGA cable to that

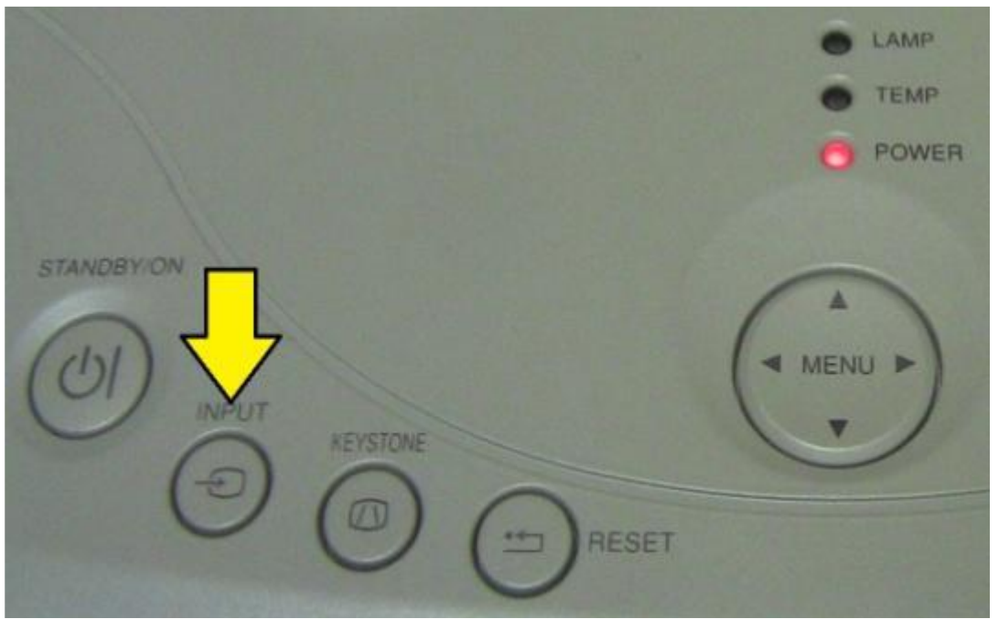
3.Connect the other end of the VGA cable to the “VGA Out” port on your laptop or other applicable device.

Step 3. Find the Laptop Signal Using the Projector.

1. Turn on your laptop and get logged in.

2. Turn on the projector using the “Standby/On” button on the top of the projector. At this time the projectors main screen will start to be projected.

3.To force the projector to search for your laptops signal press the “Input” button on top of the projector. You should see “Searching…”on the projection screen. Within a few seconds the projector will find the signal and project your desktop to the projection screen.



3. If the projector does not find your laptops signal you may have to configure the display settings on the laptop. For Windows 7 you will want to press the windows key and the P key together. This will bring up a small menu on the screen. Choose “Duplicate” to project your desktop through the projector.

Learning Objectives:

Intellectual skills:

Connect desktop computer and laptop with LCD/DLP Projector

Motorskills:

1.Ability to connect the PC to projector.

Conclusion:

1. LCD stands for ……

2. VGA stands for…….……..

Question:

1.What is projector?

2.What is port?

3.Write down the steps to connect the pc/laptop to projector.

(space for answers)

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Experiment No.18

Title:

Clean Keyboard and fitting it to computer

Prior Concepts:

Introduction of Keyboard.

New concepts:

Proposition 1: Keyboard

In computing, a **computer keyboard** is a typewriter-style device which uses an arrangement of buttons or keys to act as a mechanical lever or electronic switch. A keyboard typically has characters engraved or printed on the keys (buttons) and each press of a key typically corresponds to a single written symbol. However, to produce some symbols requires pressing and holding several keys simultaneously or in sequence. While most keyboard keys produce letters, numbers or signs (characters), other keys or simultaneous key presses can produce actions or execute computer commands.

Proposition 2: Why clean your keyboard?

Germs and disease spread rapidly when several people use the same computer and don't keep a clean keyboard. The effect could be even worse when dirt, dust, fingerprints and spilt food particles provide a home for bacteria to thrive on your keyboard. Spilled food and drink can make for sticky keys and a malfunctioning keyboard. For these reasons and more knowing how to clean your keyboard is a worthwhile endeavor.

Proposition 3: How to clean a keyboard in seven simple steps

STEP 1: Remove the cable from the back of the computer case.

STEP 2: Use a vacuum to remove food, dust and debris from between the keys. If no vacuum is available, turn the keyboard upside down and gently tap on the back side to dislodge debris.

STEP 3: Aim between the keys and blow canned, or compressed air to remove remaining dust and debris. Use short puffs of air applied at about a 30-45 degree angle to the keyboard surface. Alternate between blowing between the keys and tapping the keyboard upside down to dislodge particles until it is clean.

STEP 4: Lightly dampen a cloth with a mild soap solution and wipe down the outside of the keyboard. **Do not spray sooap solution directly onto the keyboard.**

STEP 5: Dampen a swab with isopropyl alcohol and clean between, around and on top of the keys. Change swabs as they become dirty. You may need several swabs.

STEP 6: Wipe the keyboard cord. Lightly dampen a cleaning cloth with mild soap solution and gently pull the cord through the cloth. Too tight a grip may damage it. Dry the cord with a dry cloth.

STEP 7: For dusty or dirty manufacturing environments a good keyboard cover is recommended. X-Style Universal keyboard covers by Rota Technologies, Inc are very easy to use, economical options.

Computer keyboard covers: The X-STYLE Universal Keyboard Protector by ROTA is a simple, yet effective solution to protect your keyboard against dust, dirt, grime, oil, spilled beverages and more. One size fits all keyboards.

This computer keyboard dust cover is made from a super thin, yet strong & durable material. Installation is easy. The protector covers the full keyboard and gives the user the ability to type like there is no cover present. The fit is perfect for every model keyboard on the market.

Proposition 4: How to connect and install a computer keyboard

Below are the steps on how to connect each of these types of computer keyboards.

Connecting a USB keyboard

Connect the USB keyboard to the USB ports on the back or front of your computer. If you are using a USB hub, it can also be connected to the hub. However, we recommend a direct connection to the back of the computer if possible.

Wireless keyboard

All wireless keyboards have a receiver that is plugged into the computer (typically using USB), and the keyboard connects to that receiver wirelessly. Connect this receiver either into the back or front of your computer. Once connected, make sure your wireless keyboard has batteries or is charged and turned on.

Connecting a PS/2 Keyboard

1. Connect the keyboard to the PS/2 port on the back of the computer.
2. When looking at the back of the computer, you'll notice two PS/2 ports next to each other. Verify you're connecting the keyboard to the purple connection, as shown in the picture below. If your PS/2 ports are not color coded, the keyboard will be the connection closest to the left edge of the computer (when looking at it from the back). If the connections are vertical and not horizontal like in the picture below, the keyboard connection may be either port depending on the case and motherboard. Look for a small symbol next to the port to identify which one is for the keyboard.

Learning objectives:

Intellectual skills:

Understand keyboard concept

Motor skills:

1. Ability to clean keyboard.

2.Ability to fit keyboard.

Conclusion:

1. _____ is a peripheral device.

Questions:

1. Keyboard types are?
2. How to clean keyboard?

(space for answers)

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Experiment No.19

Title: Connect different types of mouse to ports

Prior Concepts:

Introduction of mouse and port.

New concepts:

Proposition 1:

What is a mouse? A mouse is a device that controls the movement of the cursor (pointer) on a computers display screen. The plural of the mouse is mice. Some old mice have got two buttons, the right and left button while modern ones will have a third scroll button in between the two. To use the mouse, one points and clicks to issue instructions to the computer. It is an important part of the computer as it helps to make our working on the computer easy.

Types of Computer Mouse Connectors

A. Bus Mouse

The first type of mouse was connected to the PC by the use of a **bus**, so it was actually being referred to as the bus mouse. It was used in the early days of the IBM-compatible personal computers.

It connected to the PC through a specialized bus interface implemented via an **ISA add-in card**. It was superseded by the serial mouse.

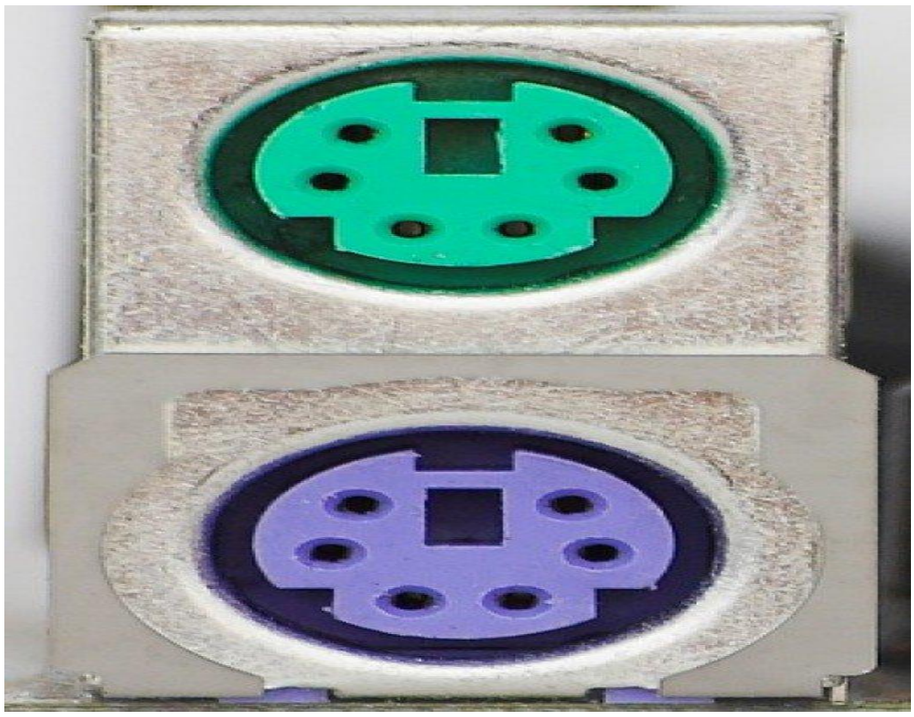
B. Serial Mouse

The serial mouse was connected to the computer via the **serialport**. A serial port is a physical communication interface through which information is transferred in and out of the computer bit by bit.

The serial port is a D-type 9 pin male port (DB9M) at the back of the motherboard. Its corresponding connector must then be a female connector for them to mate correctly. The serial mouse is obsolete.

C. PS/2 Mouse

The **PS/2 mouse** is connected on the PS/2 port (green in colour).The PS/2 mouse connector is a 6-pin mini-din connector designed in 1987. It superseded the serial connectors. Its name is derived from the IBM's personal systems/2 series of personal computers, which were introduced in 1987.This PS/2 mouse port first featured in these PS/2 systems and continued being used in newer designs even after the PS/2 systems were no longer in production.Thecolour code for the PS/2 port for most computers is usually green.



D. USB Mouse

The physical shape and appearance of the USB mouse is similar to the others. The only difference is the connector that connects to a USB port on the back of your PC. The USB port also provides power to the attached device hence eliminating the need for power connectors. It was purely designed to standardize the connection of computer peripherals like mice, keyboards, digital cameras, smart phones, PDAs, Video game consoles, removable disk drives etc.

E.Wireless Mouse

This is the latest type of mouse that does not use a cable to connect to the back of your computer. It is a neat type of mouse to use because it eliminates the clutter of cables on your desktop.

Some of the wireless mouse can connect via a USB receiver while others make use of bluetooth connection. The mouse is powered by a pair of batteries, usually AA type.

Learning objectives:

Intellectual skills:

Understand different types of ports.

Motor skills:

1. Ability to connect different types of MOUSE to ports.

Conclusion:

- In serial port bits are sent _____(one after another / simultaneously).
- PS/2 port was developed by_____(Intel/IBM).
- The RJ45 port is the_____ port on a computer (display/network).

Questions:

1.USB stands for……

2PS/2 referred as…….

(space for answers)

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

EXPERIMENT NO: 20

Title:

Install and work with Dot matrix printer

Prior concepts:

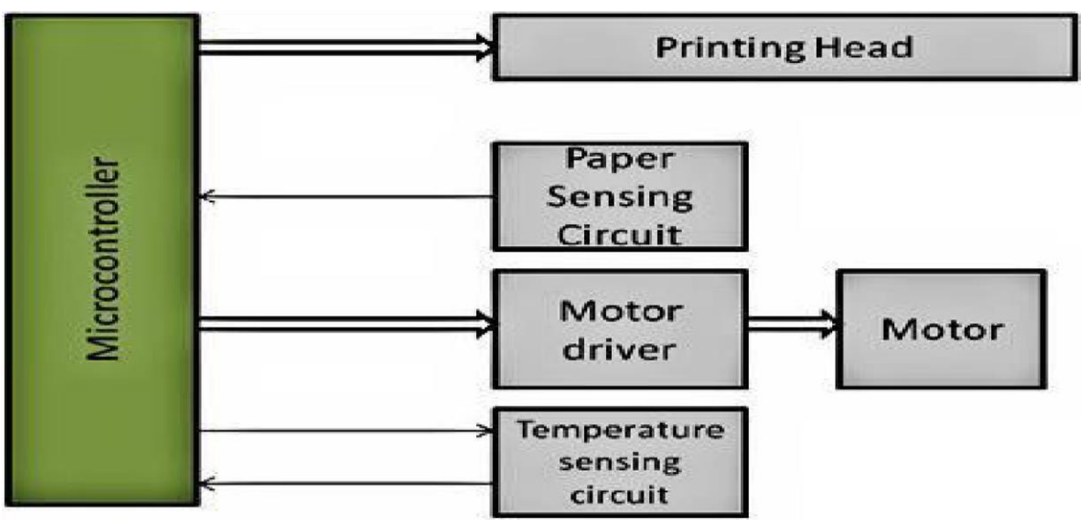
Computer with different types of printer.

New concepts:

Printer:

Printer is a output device used to print documents or pictures etc. In computing, a **printer** is a peripheral which makes a persistent human readable representation of graphics or text on paper or similar physical media.

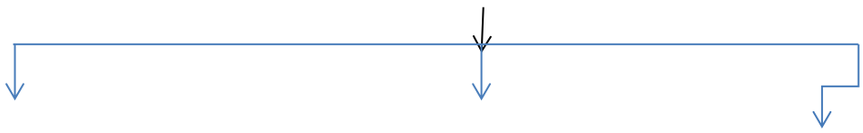
The two most common printer mechanisms are black and white laser printers used for common documents, and color ink jet printers which can produce high quality photograph quality output. The choice of print technology has a great effect on the cost of the printer and cost of operation, speed, quality and permanence of documents, and noise. Some printer technologies don't work with certain types of physical media, such as carbon paper or transparencies. Concept structure:



Proposition 1:

There are different types of printer

Types of scanner



Dot matrix inkjet laser jet

Proposition 2:

Installation of Dot Matrix Printer.

Concept structure:

Function of Dot Matrix Printer:

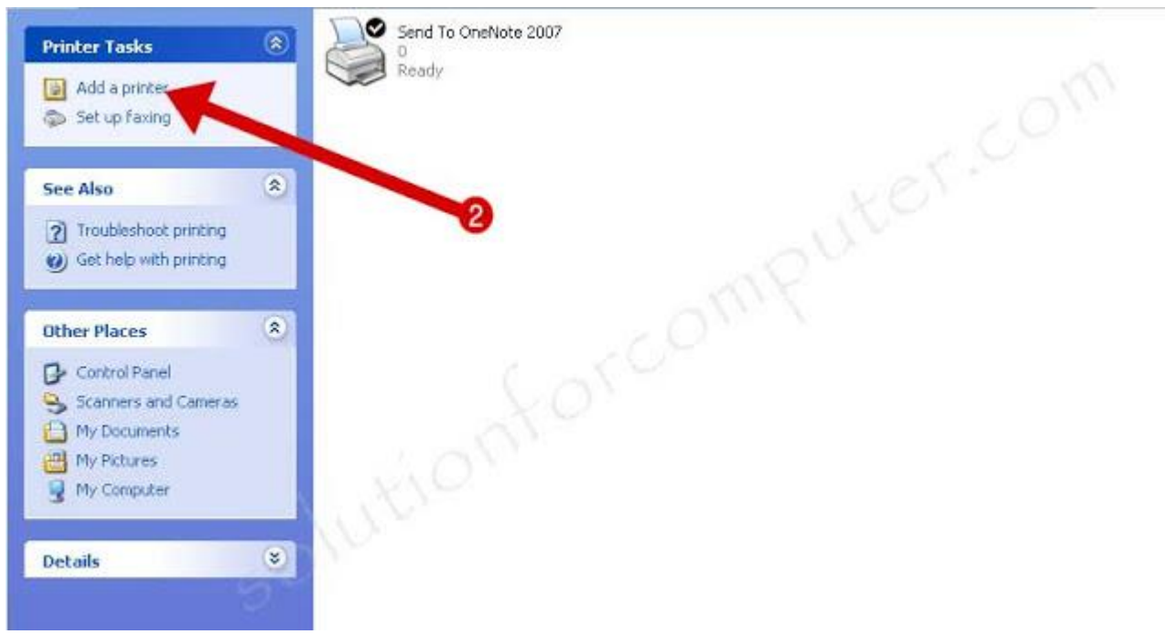
- Dot-matrix printer:

1. Can print on multi-part forms or carbon copies
2. Low printing cost per page
3. Can be used on continuous form paper, useful for data logging
4. Reliable, durable inkjet printer:

How to install dot matrix printer in windows xp (if you want to install in windows 7 its is similar steps)

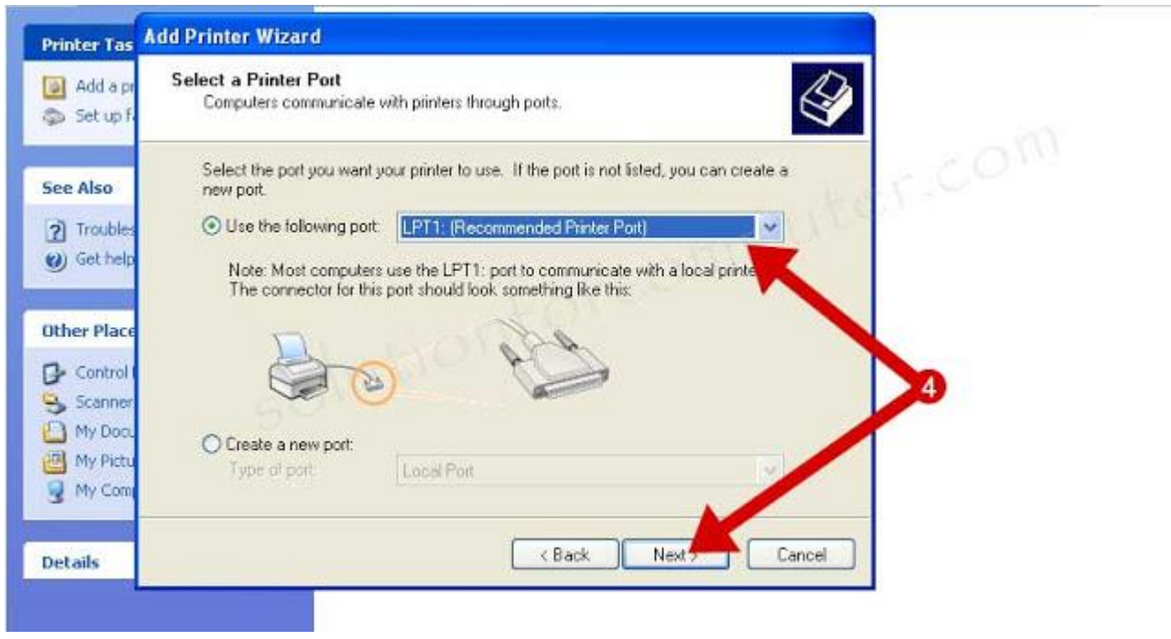
1. Click on **start** and select **Printers and Faxes** option

2. In new windows click on **Add a printer**

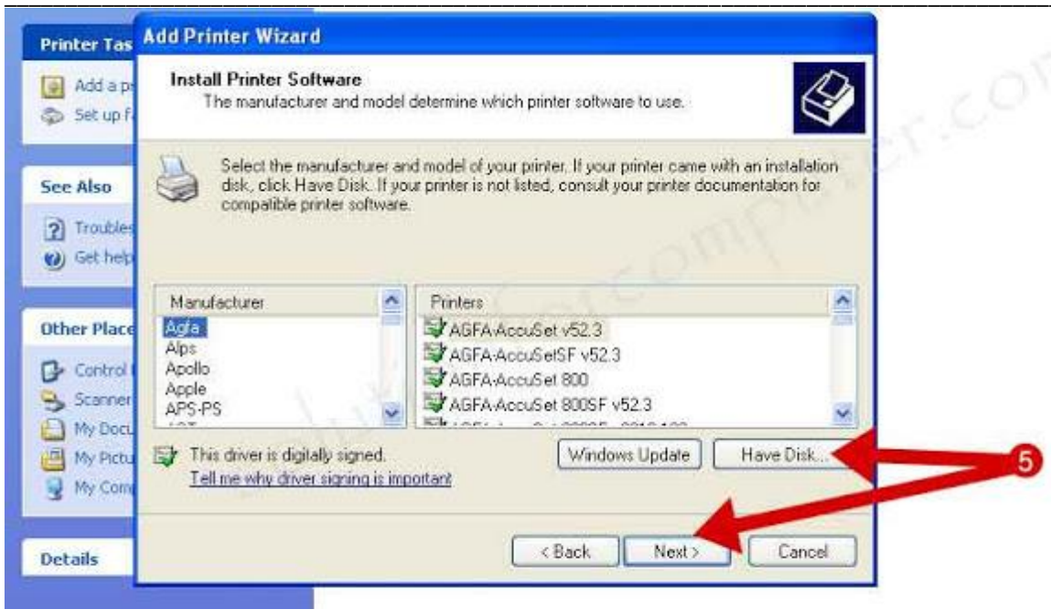


3. Select **Local printer attached to the computer** and click on **next** button.

4. Use LPT1 port in use the following port option and click on next button.

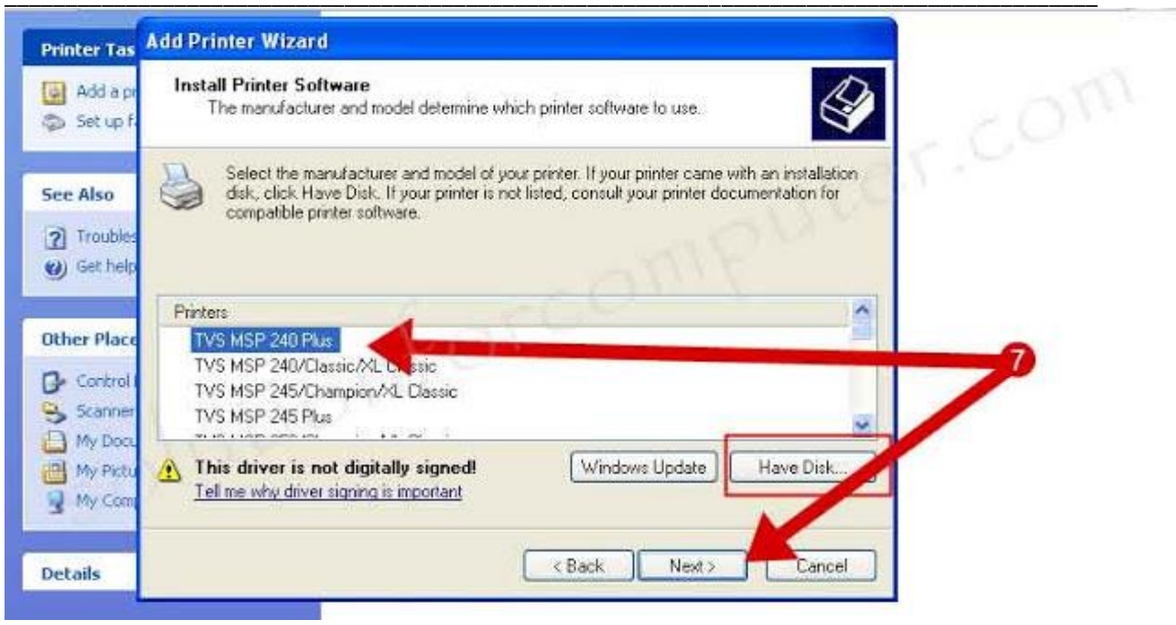


5.Select your printer in list and press next button. If your printer is not available in windows printer list then you have need printer drivers. to install printer drivers click on **Have Disk** button.



5. Now you have need to select your drivers. click on **Browse** button and select your dmp printer driver path.and click on **OK** button.

6. When you select your printer driver then you see your printer driver now show in list. **Select your printer** and click on **Next** button to continue and click on finish button.



7. Now your dot matrix printer is installed successfully in your windows xp computer.

Learning objectives:

- **Intellectual skills:**

1. Identify types of printer.
2. Different settings of printer.
3. Function of printer.

.

- **motor skills:**

1. Ability to change printer settings.
2. Ability print documents.
3. Ability to identify printer types.

Conclusion:

printer is a…….(input/output)device.

Types of printers are…….(1/2/3).

Laser printer is ……(cheap/costly).

Quality of printing is good…….(dot matrix/laser/inkjet).

QUESTIONS:

(students shall write the answer in the practical session only)

1. State the function of inkjet printers.
2. Write different types of printers.
3. State function of dot matrix printer?

(space for answers)

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

EXPERIMENT NO.21

Title : Work with Dot matrix printer settings (various types of buttons and their functions, changing ribbon cartridge, paper fitting, eject)

Prior concept :

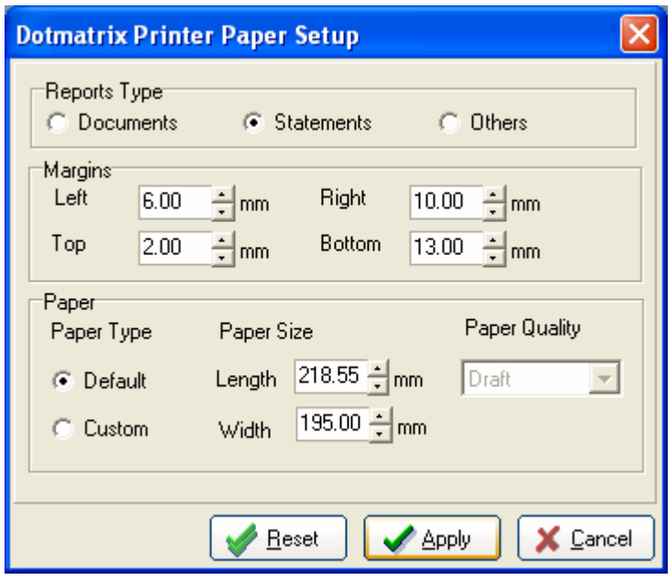
Printer.Printer settings.

New concepts:

Proposition 1:

DOT-MATRIX PRINTER PAPER SETUP

The Dot-matrix Printer Paper Setup screen will be displayed whenever you click on the Page Setup button on any of the Select the printer screens or Setup Documents and Statement Setup screens.



PRINTER OPERATING CONTROLPANEL.— The operating control panel - displays the buttons that control various functions

ControlButtons. —You can set up variousfunctions and control printing functions by manuallypushing control buttons. To activate the buttons, youmust first put the printer in an offline status. Normally,this is done by depressing the online button.

ONLINE BUTTON The online button allowsyou to put the printer in either online or offlinestatus. When in online status, the printer is underthe control of the operating system .When in offline status,the printer cannot receive data

.**LINE-FEED (LF) BUTTON** The line-feedbutton allows you to advance the printer paperone line at a time every time you press it. Onmany printers, if you depress the line-feed buttonfor more than 5 seconds, the paper feedscontinuously line by line. Regardless of how thisbutton is used, the internal line counter isincremented accordingly; therefore, the top-of-form position is never changed.

FORM-FEED (FF) BUTTON The form-feedbutton allows you to advance the printer paper tothe top-of-form (TOF) position (the top of thenext page).

TOP-OF-FORM (TOF) BUTTON Pressingthe TOF button will advance the printer paper 11/2 inches and redefine the location of TOF onthe paper. On this particular printer, it will notfeed the paper to the TOF position, as it does onmany of the high-speed printers you haveoperated.

FONT BUTTON With the font button you canselect between fonts, depending upon jobrequirements.If no selection is made, theoperating system normally defaults to the courierfont.

PRINT MODE BUTTON The mode buttonallows you to select the quality of print.

Install/Replace The Ribbon Cartridge

The printhead can get very hot during extended periods of printing be sure to let it cool off before you touch it. Be sure the power is off before you move the printhead. Open the access cover. Position the printhead between the bail rollers. Make sure the bail is closed (bail lever toward back of printer).

Learning objective:

Intellectual skills:

1.Identify the how printer is work and process to print the pages.

Motor skills:

Ability to connect the printer to computer.

Ability to install printer software to computer.

Conclusion:

Use the _____ page to view current printer information, cartridge status, and printhead health status.

Questions:

1.What is dot matrix printer?.

2.How to the page setting before print?

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

Experiment No: 22

Title: Install and work with laser printer (various types of configuration settings on printer, removing and mounting cartridge, troubleshooting paper jam)

New concepts:

Proposition 1:

To install the printer software for Windows 95 and Windows NT 4.0, you must use the Add Printer
Wizard.

1 Click **Start**, and then point to **Settings**.

2 Click **Printers**.

3 Double-click **Add Printer**.

4 Select the port that the printer is connected to, and click **Next**.

5 Click**Have Disk**. Click **Browse**.

6 On the CD-ROM, browse to the driver you want to install as follows:

aSelect your language from the directory list, and double-click.

bSelect **drivers** from the directory list, and double-click.

cSelect your operating system from the directory list, and double-click.

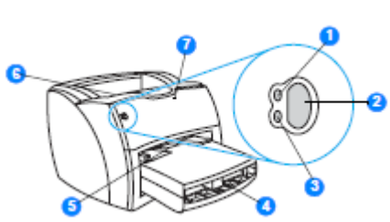
dSelect the driver from the directory list, and double-click.

eClick **OK** to select the INF file.

f Click the HP LaserJet 1150 or HP LaserJet 1300 series printer, and click **OK** to begin the installation.

7 Follow the on-screen instructions to complete the software installation.

hp LaserJet 1150 printer and hp LaserJet 1300 series printer



1 Ready light

2 Go button and light

3 Attention light

4 Main input tray

5 Priority input tray

6 Output bin

7 Print cartridge door

8 To only change the settings for the current software application

b **Note** Although the steps can vary between software applications, this is the most common method.

c **1** From the **File** menu in the software application, click **Print**.

d **2** On the **Print** dialog, click **Properties**.

e **3** Change the settings, and click **OK**.

Learning objectives:

Motor skills:

Ability to install the laser printer.

Conclusion:

1. Laser Printer is …….

Question :

1. What is Printer?

2. What are different types of printer?

3. How to install laser printer?

(space for answers)

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

EXPERIMENT NO.23

Title:

Install and work with scanner with default settings

Prior Concepts:

Computer with good configuration, Scanner and document to scan

New Concepts:

Preposition 1: Scanner

Scanner is used to scan the document and photos and makes a digital image and stores it into computer. It is used to convert hard copy to soft copy

Sample Example:

(1)How to connect scanner to computer:

There are two ways to install a scanner in Windows. The method you choose depends on whether you want to connect the scanner directly to your computer (Called a local scanner), or use a scanner that's shared on a network.

Installing a local scanner:

Most scanners connect to your computer with a universal serial bus (USB) cable. Some scanners require you to install driver software. Before connecting the USB cable, so always follow the setup instructions that came with your device. If your USB scanner didn't come with specific setup instructions, plug it in to your computer and Windows should automatically install it. If it's an older model, you might have to install it manually. For instructions, see Working with the Scanner and Camera Installation wizard.

Installing a network scanner:

Network scanners are typically found in the workplace. Before you begin, it's helpful to know the scanner model and manufacturer name.

1. Open Network by clicking the Start button, and then clicking Control Panel. In the search box, type network, and then, under Network and Sharing Centre, click View network computers and devices.

2. Locate the scanner, right-click it, and then click Install.

3. Follow the instructions to finish adding the scanner.

Installing a 'plug n play' scanner:

To install a scanner or digital camera

1. Plug your camera or scanner into your computer.

2. If your camera is Plug and Play, the Scanner and Camera Wizard starts.

-Or-

3. Double-click Add Device..

• To open Scanners, click Start, click Control Panel, click Printers and Other Hardware, and then click Scanners and Cameras.

• If you have a Plug and Play camera, Windows detects it and installs it automatically.

Information about Scanners:

A scanner is a device that captures images from photographic prints, posters, magazine pages, and similar sources for computer editing and display.

Types of scanners:

(1) Flatbed scanner

(2) Drum scanner

(3) Sheet fed scanner

(4) Handheld scanner

Learning objectives:

Intellectual skills:

Understand the interface of scanners

Understanding the concepts of scanning

Understanding the concepts of how to use scanners

Motor Skills:

Ability to connect scanner

Ability to scan a document

Ability to edit or saving scanned document

Questions:

Write answers to Q…..Q…..Q…..Q….. (Teacher should allot the questions)

1. Write steps to connect a ‘plug-n-play’ scanner?
2. How to scan a document using scanner?
3. How to reduce the resolution of scanned image, write steps?
4. Give different types of scanners available in your Lab?

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

EXPERIMENT NO: 24

Title:

Change scans settings, scanning documents/images and saving in different formats

New concepts:

Proposition1:Change Document Scan Settings

To change document scan settings

1. Open Scan Management.

2. In the left pane, click **Scan Management**, and then click **Scan Processes**.

3. In the results pane, right-click the applicable scan process, and then click **Properties**.

4. On the **Scan Ticket** tab, do one or more of the following:

a. Click the down-arrow of the **Color format** drop-down box and select an image color format and depth to save the scanned document to.

b. Click the down-arrow of the **File type** drop-down box and select a file type to save the scanned document as.

c. Click the down-arrow of the **Resolution** drop-down box and select an image resolution to save the scanned document to.

5. To allow a user to select scan settings at the scanner and override settings specified for this scan process, select the applicable **Allow value override at scanner** check box.

6. Click **Verify that these settings will work with your scanner**.

7. In the **Validate Scan Ticket Settings** dialog box, type the name of the scanners you want to verify setting compatibility with, and then click **Start**.

8. When finished, click **Done**, and then click **OK**.

Additional considerations

- To open Scan Management, click **Start**, point to **Administrative Tools**, and then click **Scan Management**.

- You must have Full Access or Modify permissions in order to change or modify a scan process.

Proposition2: Scanning Documents and Images

Scanners capture a digital image of the contents on the surface. When scanning materials it is important to understand the concept of **DPI** (dots per inch). DPI is a specification used for printed (and scanned) media that determines quality. Scanned images with a higher DPI will look more realistic compared to the original, but scanning at a high DPI can take a long time and use large amounts of disk space.

While DPI refers to physical dimensions, the resolution of the image refers to the size of the image relative to your computer screen. A file that is 4000 x 5000 pixels is ideal for archiving, but would take a long time to download on the Internet. When scanning documents it is critical to choose a proper file type. Common types include **.PDF**, **.JPG**, **.GIF**, **.TIF**, and **.PNG**. The file type you select is dependent on the type and purpose of the scanned document.

Text

Scanning text documents is a relatively smooth process that does not take a lot of time. The lowest DPI that is needed for the scanned text to display and print properly is 300 DPI. If the text is going to be reprinted, a DPI setting of 600 or better is ideal. When saving text documents it is best to save the files as .PDF (portable document format). If you want to edit the text, use the Optical Character Recognition (OCR) feature on your scanner.

Grayscale

Grayscale documents and images are those that do not contain color, but use gradients (shades) of black to produce the image. Grayscale images should be scanned at or above 600 DPI in a .PNG format. Grayscale documents should be saved as a .PDF file at a DPI of 300 to 600. If the files are for the web, saving them as a .GIF will reduce the file size.

Halftone

. Halftone images are made up of small dots that form an image. The reprographic technique was used before modern printing was invented. Halftone images should be scanned at a DPI of 1200 or greater in order for the scanner to capture the halftone properly. Since it is made up of dots, it is important that the system processes the halftone correctly. Halftones should be saved as a .PNG file

Color

Color images and documents are the most common scanned objects. Color photographs should be scanned at 600 DPI, however; scanning at a DPI of 1200 will ensure archival-

quality photographs. Scanning above 1200 DPI is overkill and not necessary. When scanning for the web, color photos should be scanned at 300 DPI. Color photos should be saved as .PNG. Color documents should be scanned at 300 DPI and saved as a .PDF.

Proposition3: Scanning and saving documents

Click the **Scan** tab and then click a task:

- **Scan to OCR Editor** opens scans in the OCR Editor.
- **Scan to PDF** creates PDF documents from images obtained from a scanner or digital camera.
- **Scan to Microsoft Word** creates Microsoft Word documents from images obtained from a scanner or digital camera.
- **Scan to Microsoft Excel** creates Microsoft Excel documents from images obtained from a scanner or digital camera.
- **Scan to Image Files** creates image-only documents from images obtained from a scanner or digital camera.
- **Scan to Other Formats** creates documents in popular formats, such as *.odt, *.pptx, *.epub, and *.html, from images obtained from a scanner or digital camera.
- Select a device and specify scanning settings.
- Click the **Preview** button or click anywhere inside the image.
- Review the image. If you are not satisfied with the quality of the image, change the scanning settings and click the **Preview** button again.
- Specify the settings specific to the selected format.
These settings determine the appearance and properties of the output document.
- Click the **Scan to <format>** button.
- When scanning starts, a dialog box with a progress bar and tips will be displayed.
- After a page has been scanned, a dialog box prompting you to decide what to do next will be displayed.
Click **Scan Again** to scan more pages using the current settings or click **Finish Scanning** to close the dialog box.

Depending on the task you selected in step 1, the scanned images will be:

Processed and added to an OCR project in the OCR Editor.

Processed and converted to PDF. Specify the folder where you want to save the resulting document. The document will remain open in the OCR Editor.

- Processed and converted to the selected format. Specify the folder where you want to save the resulting document. The document will remain open in the OCR Editor.

Learning Objectives:

Intellectual skills:

Identify types of images**.**

Motor skills:

Ability to scan a document.

Conclusion:

The lowest DPI that is needed for the scanned text to display and print properly is _____ (300/600).

- **Questions:**

1. What are different types of images?
2. How to scan a document?

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C(4)	P(4)	A(2)	Total(10)	Dated Signature of Teacher

EXPERIMENT NO. 25

Title: Connect Modem, Hub/Switches/routers physically

Prior Concepts: Understanding the basic concepts of Modem,Hub/Switch/Router

New concepts:

Proposition 1:

To understand what connecting devices are, it is important to know about Backbone Networks. Backbone Network is a means of connecting 2 LAN's. It provides a transmission channel for packets from being transmitted from one LAN to the other. The individual LAN's are connected to the Backbone Network by using some types of devices such as Hubs, Repeaters, Switches, Bridges, Routers and Gateways.

Hub

A hub works in the physical layer of the OSI model. It is basically a non-intelligent device, and has no decision making capability. What a Hub basically does is take the input data from one of the ports and broadcast the information to all the other ports connected to the network.

Repeater

A repeater is a device similar to the Hub, but has additional features. It also works in the Physical layer. The repeaters are used in places where amplification of input signal is necessary. But, the kind of amplification done by the repeater is different from the regular amplification by amplifiers. The regular amplifies everything fed into it. That means, if the input signal has noise induced into it, both the desired signal and noise signal are together amplified. But, in the case of a repeater, it regenerates the input signal, and amplifies only the desirable signal. Hence, the noise component of the signal is eliminated.

Switch

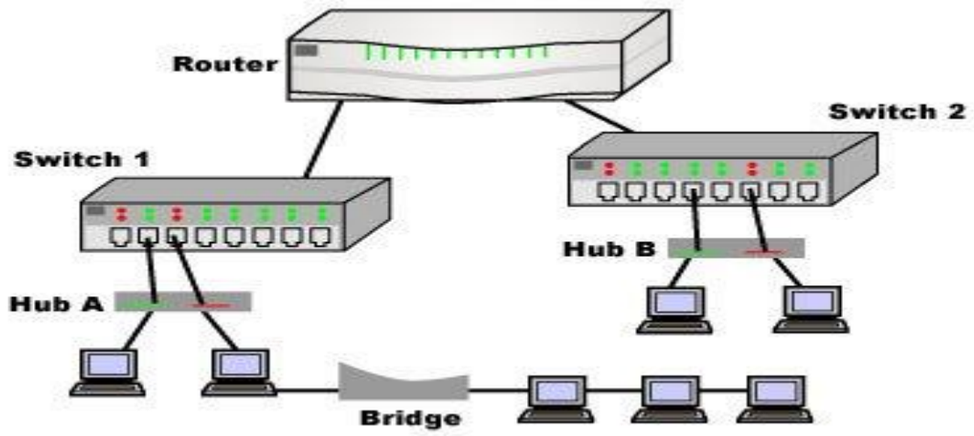
A switch is an intelligent device that works in the data link layer. The term intelligent refers to the decision making capacity of the Switch. Since it works in the Data link layer, it has knowledge of the MAC addresses of the ports in the network.

Router

Any computer can be connected to the internet via MODEM, which performs the MODulation and the DEModulation operations. But, when there are more than one computer at home or in an organization, and you have a single internet connection, you need a Router. Router is a device which is used when multiple devices need to connect to the Internet using the same IP.

the router does the job of connecting multiple devices in a LAN to the internet using the same IP address. Since the router works in the Network Layer, it does forwarding on the basis of IP addresses.

The WiFi routers that are commonly used now are the IEEE 802.11 b/g standard router.



Connecting a modem to your computer

To connect a modem to a 25-pin serial port, pins 2, 3, 7, 8, and 20 must be wired *straight through* (meaning the pins are connected: pin 2 to pin 2, pin 3 to pin 3, and so on). In addition, pins 4 and 5 must be connected straight through if RTS/CTS flow control is used. If you are unsure what to use, a cable that connects all pins straight through should work correctly

A COM port on a computer is usually DTE (Data Terminal Equipment) type, and a modem port is usually DCE (Data Communications Equipment) type, so that a straight-through cable is suitable for connecting the two. However, COM ports on some serial expansion boards are DCE type. If this is the case, you need a null-modem cable to connect a modem. Check your hardware documentation if you are unsure.

Learning Objectives:

1. Understand the use of Modem,hub,switch,router.

Conclusion:

1. A swich works in _____ (data link layer/application layer).

Questions:

1. What is Hub,switch and router?

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EXPERIMENT NO. 26

Title: Prepare and test crossover and straight cable, CAT5,CAT6Cable,using Crimping tools, Splicer

New concepts:

Proposition 1:

Build and test an Ethernet straight-through patch cable

Step 1: Obtain and prepare the cable

a. Determine the length of cable required. This could be the distance from a computer to a switch or between a device and an RJ-45 outlet jack. Add at least 30.48 cm (12 in.) to the distance. The TIA/EIA standard states the maximum length is 5 m (16.4 ft.). Standard Ethernet cable lengths are usually .6 m (2 ft.), 1.83 m (6 ft.), or 3.05 m (10 ft.)

b. Cut a piece of cable to the desired length. Stranded UTP cable is commonly used for patch cables (the cables between an end network device such as a PC and an RJ-45 connector) because it is more durable when bent repeatedly. It is called stranded because each of the wires within the cable is made up of many strands of fine copper wire, rather than a single solid wire. Solid wire is used for cable runs that are between the RJ-45 jack and a punch-down block.

c. Using wire strippers, remove 5.08 cm (2 in.) of the cable jacket from both ends of the cable

Step 2: Prepare and insert the wires

a. Determine which wiring standard will be used. Circle the standard. [T568A | T568B]

b. Locate the correct table or figure from the “Wire Diagrams” based on the wiring standard used

. c. Spread the cable pairs and arrange them roughly in the desired order based on the standard chosen.

d. Untwist a short length of the pairs and arrange them in the exact order needed by the standard moving left to right starting with pin 1. It is very important to untwist as little as possible. The twists are important because they provide noise cancellation.

e. Straighten and flatten the wires between your thumb and forefinger.
f. Ensure the cable wires are still in the correct order as the standard.

g. Cut the cable in a straight line to within 1.25 to 1.9 cm (1/2 to 3/4 in.) from the edge of the cable jacket. If it is longer than this, the cable will be susceptible to crosstalk (the interference of bits from one wire with an adjacent wire).

h. The key (the prong that sticks out from the RJ-45 connector) should be on the underside pointing downward when inserting the wires. Ensure the wires are in order from left to right starting with pin 1. Insert the wires firmly into the RJ-45 connector until all wires are pushed as far as possible into the connector.

Step 3: Inspect, crimp, and re-inspect

a. Visually inspect the cable and ensure the right color codes are connected to the correct pin numbers.

b. Visually inspect the end of the connector. The eight wires should be pressed firmly against the end of the RJ-45 connector. Some of the cable jacket should be inside the first portion of the connector. This provides strain relief for the cable. If the cable jacket is not far enough inside the connector, it may eventually cause the cable to fail.

c. If everything is correctly aligned and inserted properly, place the RJ-45 connector and cable into the crimper. The crimper will push two plungers down on the RJ-45 connector.

d. Visually re-inspect the connector. If improperly installed, cut the end off and repeat the process.

Step 4: Terminate the other cable end

Proposition2:

Build and test an Ethernet crossover cable

Step 1: Obtain and prepare the cable

a. Determine the length of cable required. This could be from a hub to a hub, hub to switch, switch to switch, computer to router, or from one computer to another computer. Add at least 30.48 cm (12 in.) to the distance.

b. Cut a piece of cable to the desired length and, using wire strippers, remove 5.08 cm (2 in.) of the cable jacket from both ends of the cable.

Step 2: Prepare and insert the T568A wires

a. Locate the T568A table at the beginning of the lab.

b. Spread the cable pairs and arrange them roughly in the desired order based on the T568A standard.

c. Untwist a short length of the pairs and arrange them in the exact order needed by the standard moving left to right starting with pin 1. It is very important to untwist as little as possible. Twists are important because they provide noise cancellation.

d. Straighten and flatten the wires between your thumb and forefinger.

e. Ensure the cable wires are in the correct order based on the standard

. f. Cut the cable in a straight line to within 1.25 to 1.9 cm (1/2 to 3/4 in.) from the edge of the cable jacket. If it is longer than this, the cable will be susceptible to crosstalk (the interference of bits from one wire with an adjacent wire).

g. The key (the prong that sticks out from the RJ-45 connector) should be on the underside pointing downward when inserting the wires. Ensure the wires are in order from left to right starting with pin 1. Insert the wires firmly into the RJ-45 connector until all wires are pushed as far as possible into the connector.

Step 3: Inspect, crimp, and re-inspect

a. Visually inspect the cable and ensure the right color codes are connected to the correct pin numbers

b. Visually inspect the end of the connector. The eight wires should be pressed firmly against the RJ-45 connector. Some of the cable jacket should be inside the first portion of the connector. This provides for cable strain relief which can eventually cause the cable to fail.

c. If everything is correctly aligned and inserted properly, place the RJ-45 connector and cable into the crimper. The crimper will push two plungers down on the RJ-45 connector. d. Visually re-inspect the connector. If improperly installed, cut the end off and repeat the process.

Step 4: Terminate the T568B cable end

Step 5: Test the cable

a. Use the cable to connect two PCs

b. Visually check the LED status lights on the NIC card. If they are on (usually green or amber) the cable is functional.

c. On both computers, open a command prompt.

d. On both computers, type ipconfig.

e. Write the IP address of both computers. Computer 1: Computer 2:

f. From the command prompt of one computer, type ping IP address of the other computer. If the cable is functional, the ping should be successful. Perform a ping from the other computer as well

g. Was the ping successful? h. If the ping fails, repeat the lab

Learning Objectives:

Understand the connectivity of cables.

Conclusion:

Ability to test the crossover cable.

Questions:

1.What is crossover cable?

2.Explian use of crimping tool.

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EXPERIMENT NO. 27

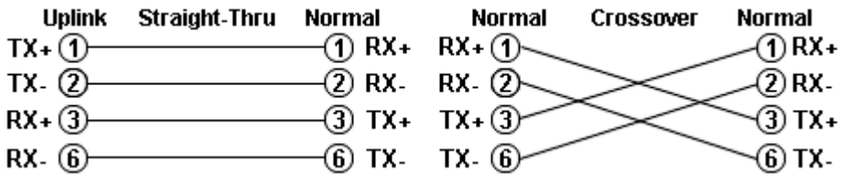
Title: Connect two Switches/Hubs using normal and uplink port

New concepts:

Proposition 1:

What is an uplink port and what are the ways to connect two hubs/switches together?

A. There is no big mystery about the difference between an uplink and a regular port. Each Ethernet interface has two transmit pins + and - and two receive pins (the other pins may have wires running between them, but they are not used). The transmit pins at one end of a cable have to be connected to the receive pins at the other end and vice versa. An uplink port does not crossover the transmit and receive pins and a regular port does.



If two hubs/switches are connected together with a straight-thru cable then one end must crossover (regular port) and one end must not (uplink port). If a **crossover cable** is used to connect them, then the ports at both ends must be the same kind of port. If a straight-thru cable is used to connect them, then the ports must be different. A PC can be connected to an uplink port with a crossover cable and to a regular port with a **straight-thru cable**. Also, be aware that many hubs/switches share the uplink port with one of the regular ports, usually port 1. Both ports will not work if they are both connected at the same time. Finally, many hubs and switches have a switch associated with the uplink port that can switch the port between uplink and regular port configurations.

Learning Objectives:

Ability to use the uplink port to connect two hubs/switches.

Conclusion:

Understand the use of uplink port.

Questions:

1.What is Hub?

2.What is switch?

3.Explain use of uplink port.

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Experiment No: 28

Title: Write on CD/DVD, single session/multisession

Prior concepts:

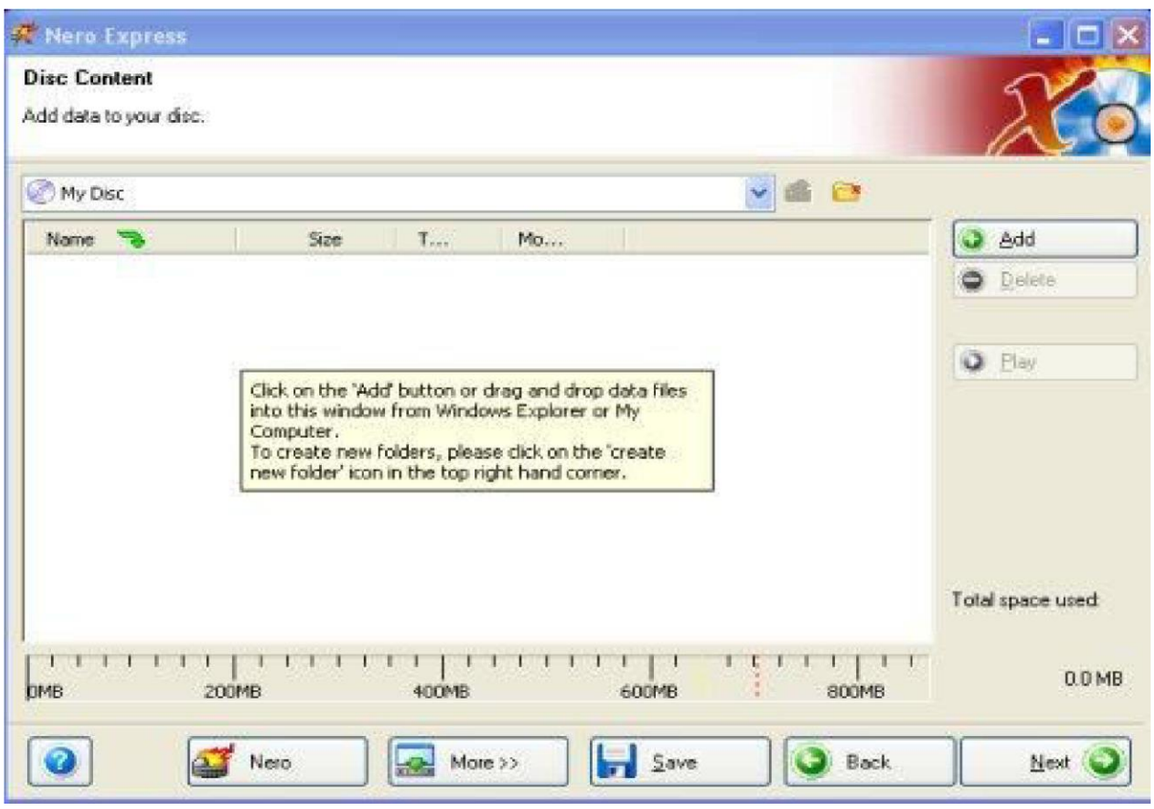
Nero Express software has to used installed in the computer

New concepts:

Proposition 1: How to Write a Data on CD Using NeroExpress

1. Launch Nero Express, click **All Programs**, **Nero**, **Nero OEM**, **NeroExpress**.

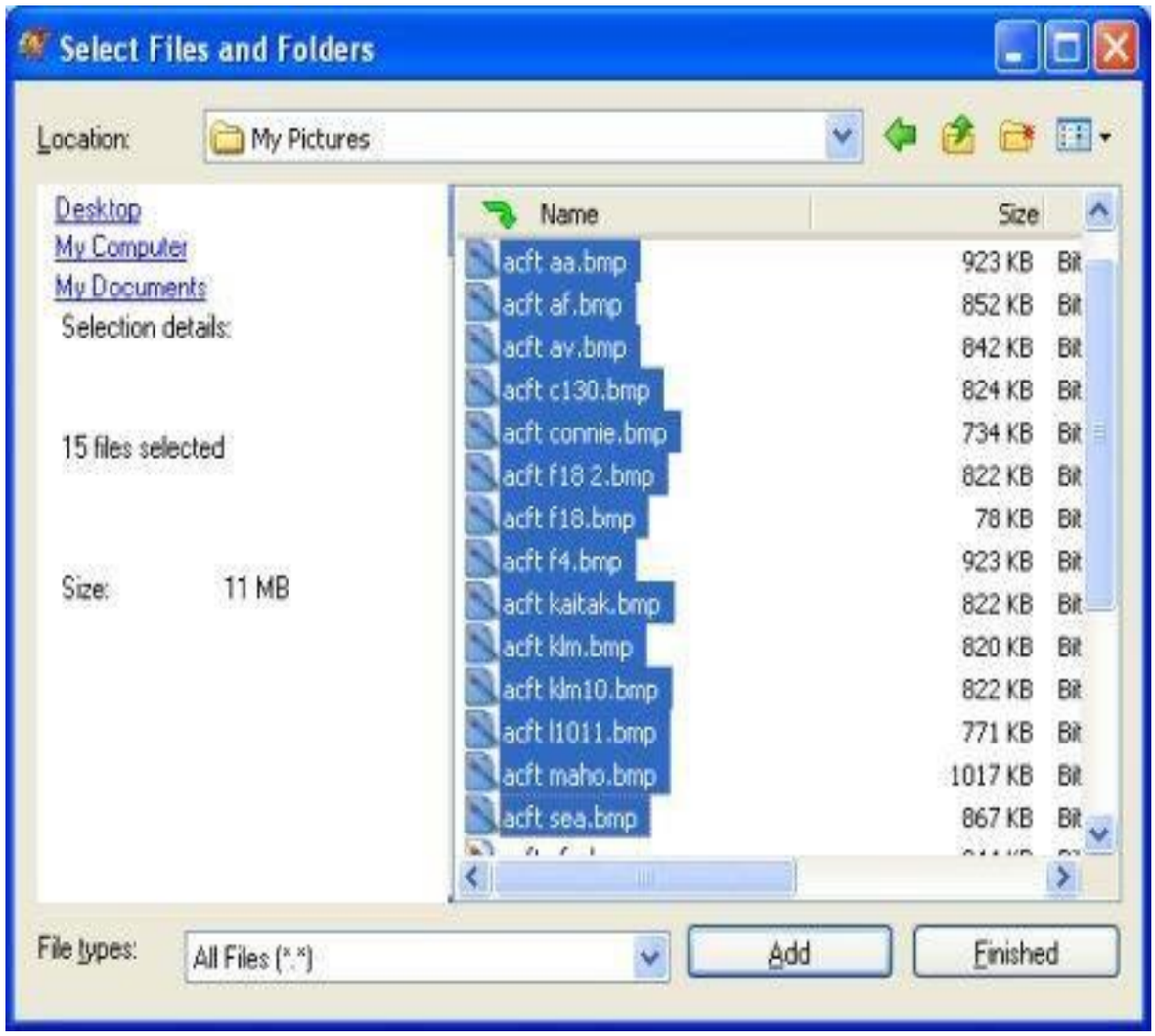
2. This will bring up the Nero Express main window. Click **Data**, **Data Disc**. This brings up the Nero Express "Disc Content" window. To add data to be written to CD, click**Add** or drag and drop data into the Disc Content window, see Figure 1. **Figure 1: Disc Content**



NOTE: You might see data from previous writes to the CD show up in window, but 'faded' to represent data already written to the media.

4.This brings up the "Select Files and Folders" window. Highlight those files and folders you wish to add, and click **Add**. Hold down the Shift key to select all the files, or hold down the Ctrlkey to select individual files, see Figure 2.

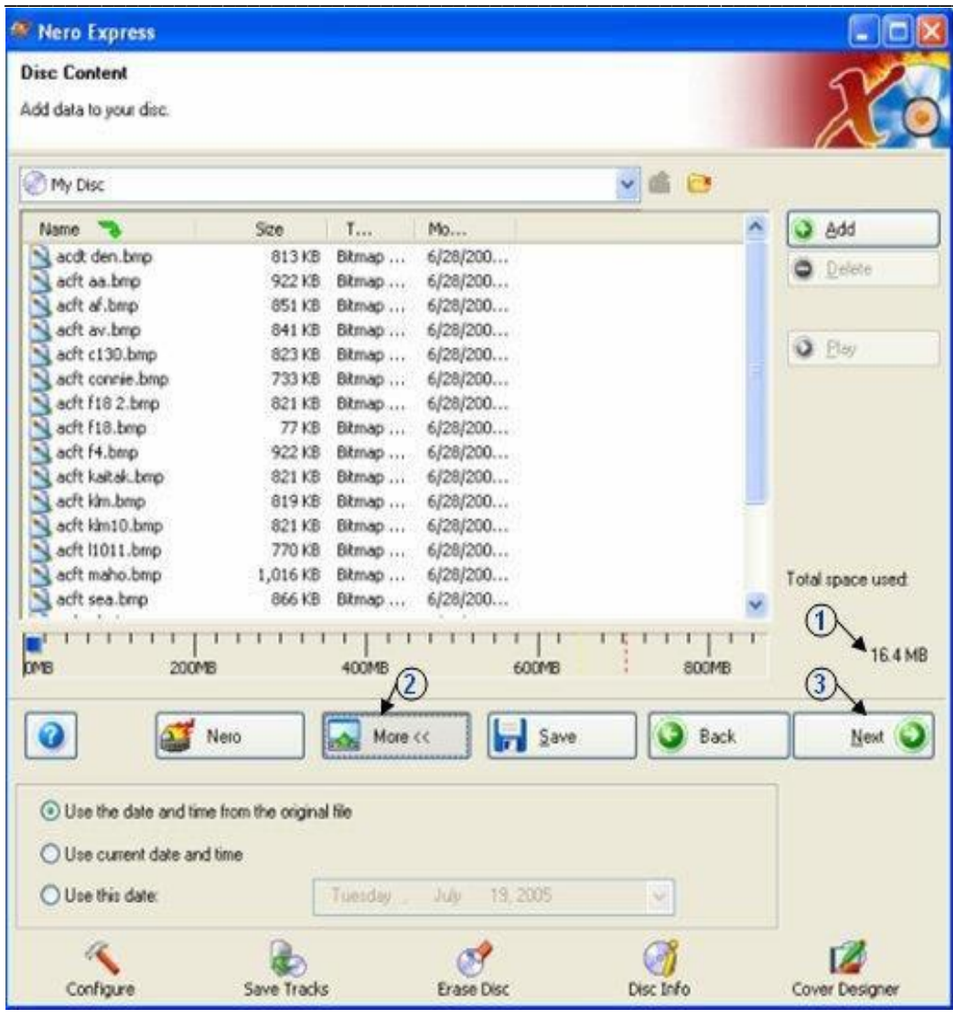
Figure 2: Select Files and Folders window



5. Click **finished** button once all the Files and Folders have been selected.

6. This will bring back the "Disc Content" window. This window will show how much space write operation will use. Click **Next** to move on to the next step, or click **More** for additional options, see Figure 3.

Figure 3: Data Content



1 - Total space used

2 - More button

3 - Next button

7. Selecting **more** will bring a drop down window that will allow some limited control over the files and directories date and time settings. Click **Next** to continue the burn process after having made the adjustments, see Figure 3.

NOTE: The new data you have added will show up in dark black. Old data will continue to show up as faded.

8.This brings up the "Final Burn Settings" window. Some choices have to made here, see Figure 4:

1. Select the Recording device.

2. Provide the Disc you are about to create with a name.

3. Set the Write Speed.

4. Decide if the CD will be Multisession, enable this feature to allow all data that will be written to this CD, now and later, to be seen. If it's not enabled, only the data last written to the CD will be seen when mounted.

5. Choosing "Verify data on disc after burning" verifies data was written to CD correctly. Always enable this aspect for critical data that you can not afford to loose. Click **More** after selections have been made for additional advanced configuration capabilities. Or click **Burn** to begin the Write operation to the CD.

Selecting "Burn", will go to the final step. Selecting "More" option, will bring a drop down window for more added control of the write method used, and see Figure 4. Write Method: If you have the option for "Allow files to be added later" enabled, as shown earlier in this document, will be pre-set to Track-At-Once mode and you will not be able to select any other option.

Finalize Disc: Selecting this feature will close the disc to any future writing.

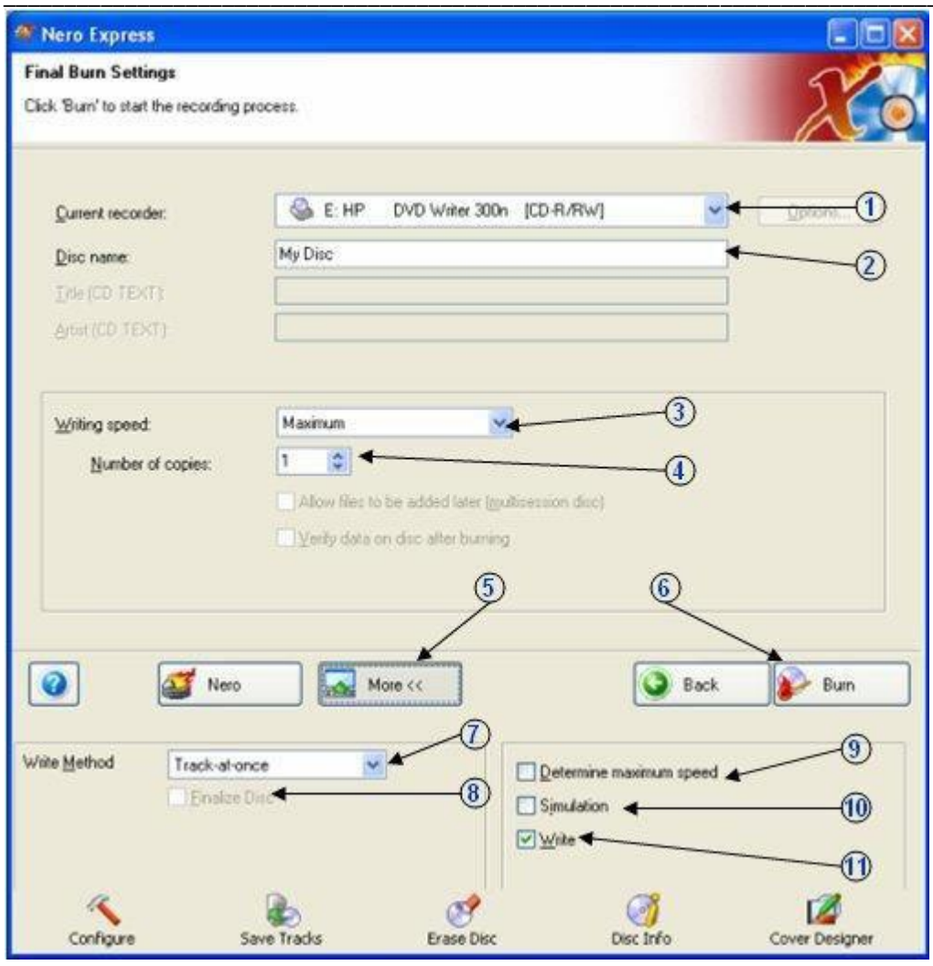
Determine maximum speed: The speed test determines how quickly the compiled files can be accessed. If the access speed is slower than the burning speed, the burning speed is reduced so as to avoid a buffer underrun.

Simulation: The simulation runs all the steps involved in burning a disc apart from activating the laser, so that you can assume that if the simulation is successful, the burning process will also be successful.

And avoid the possibility of wasting media if it were to fail.

Write: This checkbox enables the actual physical burning process.

Figure 4: Final Burn Settings window



1 - Recording device field

2 - Disc name field

3 - Write speed field

4 - Number of copies field

5 - More button

6 - Burn button

7 - Write Method field

8 - Finalize Disc checkbox

9 - Determine maximum speed checkbox

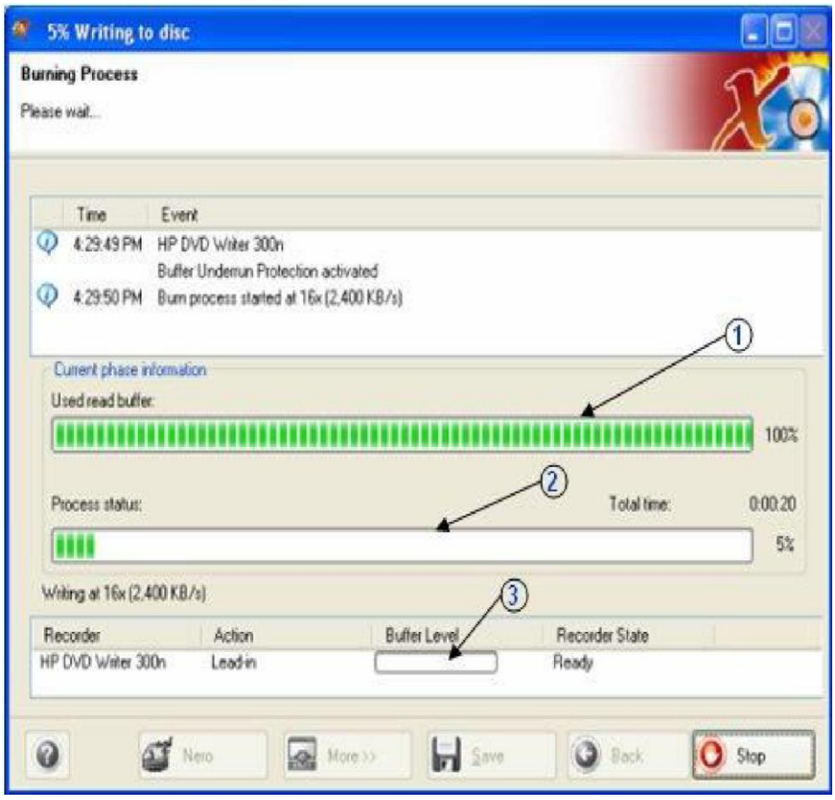
10 - Simulation checkbox

11 - Write checkbox

10. Selecting the "Burn" option when there is no recordable media in the recorder at the time, will bring up a window requesting a blank CD- R or CD-RW media to be inserted in the Recorder. Insert a blank disc and Nero Express will detect it and begin burning automatically.

11. Nero Express then begins the burn process, see Figure 5.

Figure 5: Burning Process

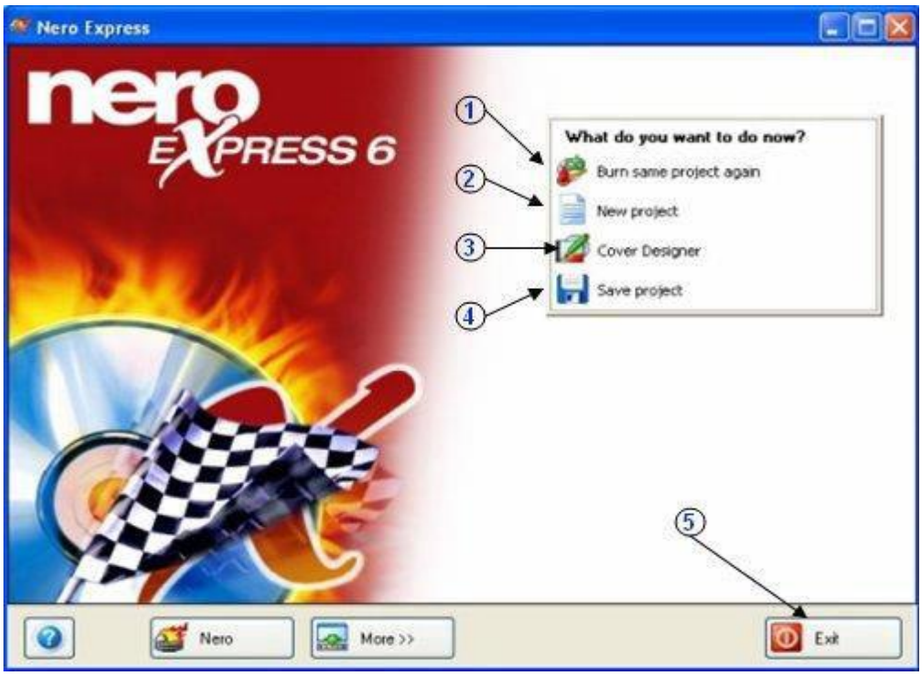


1- Used read buffer 2 - Process status 3 **- Buffer Level**

This brings up the Burning Process window. If any error messages are received during the write and/or the write fails, be sure to Save the Nero log file to the desktop. This file will have critical information about the system, as well as a very detailed description of the write process that was attempted. And it will provide exact error codes that will help the Technical Support team to trouble-shoot the issue. Without this file, we may not be able to properly assist in resolving the issues.

If the write process was a success. Click **Next** to continue.

This brings us to the completion of the Audio write process. Here you can choose to **Burn the same project again**; start a **New project**; launch the **Cover Designer** to create a label; **Save project**; or **Exit** the Nero Express program, see Figure 7.



1 - Burn the same project again

2 - New project

3 - Cover Designer

4 - Save project

5 - Exit button

Learning objectives:

Intellectual skills:

1. Understand the Configure and installation suing Nero express in the computer

Motor skills:

1. Ability to run the nero express software has to ability to give the copy command. Add the files to add option .

Conclusion:

CD burn a process is……..

Question :

1.What is nero express ?

2.How the nero express run on the pc?

3.How will you installed the nero express?

4.From where you choose the file to add?

5.What kind of cd or dvd are used to copy or rewrite?

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EXPERIMENT NO.29

Title: Identify fiber optic cable construction and connectivity

New concepts:

Proposition 1:

An **optical fiber cable**, also known as **fiber optic cable**, is an assembly similar to an electrical cable, but containing one or more optical fibers that are used to carry light.

Optical fiber consists of a core and a cladding layer, selected for total internal reflection due to the difference in the refractive index between the two.

How Fiber Optic Cables Work

Fiber optic cables use glass fiber strands covered with an insulated casing to send and receive communication signals using light pulses. Each cable can have up to a thousand strands of fiber, with the ability to send terabytes of data in a second. These types of cables have very high bandwidth and can be used over long distances with very little data degradation.

Fiber optic cables are fast because they literally send data at the speed of light. A laser transmitter encodes data into pulses of light that are sent through the cables. When the light pulses reach their destination, they are translated again, back into data that can be read by the receiving device, such a computer.

Reasons to Use Fiber Optic Cables

Computer networks today can be wired using copper or fiber optics. Copper has been used in a variety of applications since the 1920s. It's inexpensive, easy to use, and a great conductor for electricity. Old telephone lines use copper and many are still around today. However, fiber optics have some distinct advantages over copper wires when it comes to transferring data between computers. Fiber optic cables have a higher bandwidth capacity even at long distances, experiences less interference, and are very durable.

How to Install Fiber Optic Cables on a Computer Network

Steps to Installing Fiber Optic Cables on a Computer Network

1. Position all the devices that will be included in the network. The hubs and switches should be placed near the main computer and the wall outlet (for integrated fiber in the loop, IFITL connections). Connect the computer to the wall outlet using the cable and connect the hubs and routers to the computer.

2. Add a fiber optic cable to the hub or router and connect it to a second computer to be added to the network. Ensure that there's enough slack in the cable so it's not too tight and easily unplugged. Secure the cables with ties.

3. A media converter is necessary for devices that have no fiber optic outlet. This converter changes the light pulses into electricity. Plug this into the computer with a USB or Ethernet cable. Plug in any workstation without a fiber optic outlet into the converter.

4. Turn on all the devices and computers on the network.

5. Install additional software and drivers on devices if needed.

Learning objectives:

- **Intellectual skills:**

1. Identify fiber optic cable connectivity.

- **Motor skills:**

1. Ability to connect the fiber optic cable with network.

Conclusion:

1. An optical fiber cable is _____ _____.

Questions.

1.What is optical fiber cable?

2.What are reasons to use fiber optic cable?

3.How fiber optic cables works?

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Experiment No.30

Title:

Identify Wi-Fi environment and its setup

New concepts:

Proposition 1:

Modem – The modem is the first link in this chain. It allows your home to connect to the Internet. It's a small box with three connections on it: power, Ethernet, and coax or phone (you may find a USB port as well, just pretend it doesn't exist, like the Matrix). Power is for, well, power. If you have cable Internet then the modem will have a coax cable jack on the back. It's the only connection with threads for screwing in the cable. The last jack is Ethernet, which looks like a wide phone jack. This connects to the port on the back of your router labeled "WAN" and provides an Internet signal to the wireless router. If you find that your modem has multiple Ethernet jacks, then is it what is referred to as a gateway, and likely also has built-in wireless.

Wireless Router – The wireless router performs two main tasks. First, it takes the Internet signal from the modem and transmits it wirelessly in your home. Somewhere on the box of your router, it will tell you what types of wireless protocols it broadcasts. You've likely heard of wireless g or wireless n, or seen the specification 802.11g or 802.11n at some point during the purchasing of your router. As wireless technology has developed, new wireless protocols

have emerged. Over the past 6 years or so, wireless g has slowly been phased out by a newer protocol, wireless n. Over the past 2 years, the newest wireless protocol, wireless ac has started to come into prominence. There are two older protocols called wireless a and wireless b, but those where largely phased out years ago. As you run across these terms, know that the term “wireless g” and “802.11g” can be used interchangeably. The same goes for any wireless protocol, like 802.11n and 802.11ac.

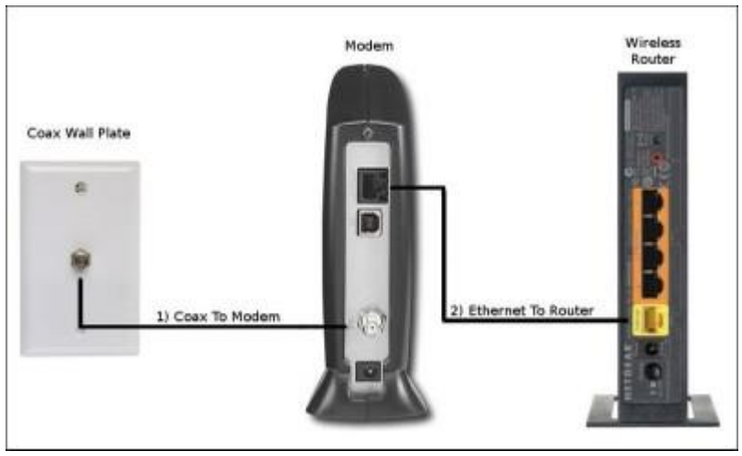
The second task a router performs is something called “DHCP”. We’ll skip over all of the details, but know that it allows multiple devices to connect to the modem. You’ll notice that the modem only has one Ethernet jack on it, meaning that only one device can connect to the Internet at a time. A router will typically have 4 or more “LAN” jacks for other devices on your network to connect to the Internet, plus all of the wireless devices in your home.

Computer – Instead of computer, put “wireless device”, because many different types of devices can connect to a wireless network. Nearly all modern computers, tablets, phones, and game consoles have built-in wireless. The reason specified a computer is because in this tutorial the best device to use to configure the wireless network is a computer. In fact, it’s best to hardwire the computer to the router with an Ethernet cable.

1 & 2) Connect the modem and router

The key to successfully setting up a network is to hook up and power on devices in the proper order. First, connect the coax cable (or phone cable for DSL modems) from the wall to the modem.

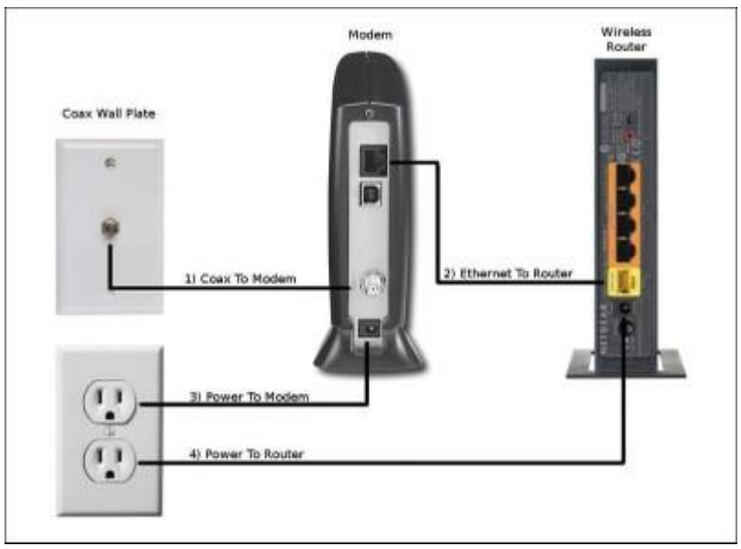
Second, connect an Ethernet cable from the modem to the “WAN” jack on the router. This jack might also be labeled “Internet” and/or be colored differently than the other Ethernet plugins on the router.



3 & 4) Power on modem then router

Connect the power cable from the wall to the modem. The modem will take a few minutes to fully start up. On the front of the modem should be a light labeled “online”, ensure that it is solid before proceeding. If you can’t find that light, just wait a few minutes for the modem to start and connect to the Internet. Next, connect the power cable for the router. Again, wait a

minute or two for it to start up completely. Some routers have an “Internet” light that will turn solid once it’s started. As always, you can consult the product manuals to find out what the various lights mean.



5) Connect computer and login to router

Now you can connect your computer to the router using an Ethernet cable. Most computers only have a single Ethernet jack, so connect the cable form the input on the computer to one of the jacks labeled “LAN” on the router. Most routers have 4 LAN connections, any one of them will work fine. Give the computer a minute or two to connect to the Internet. At this point, we can test that everything is working.

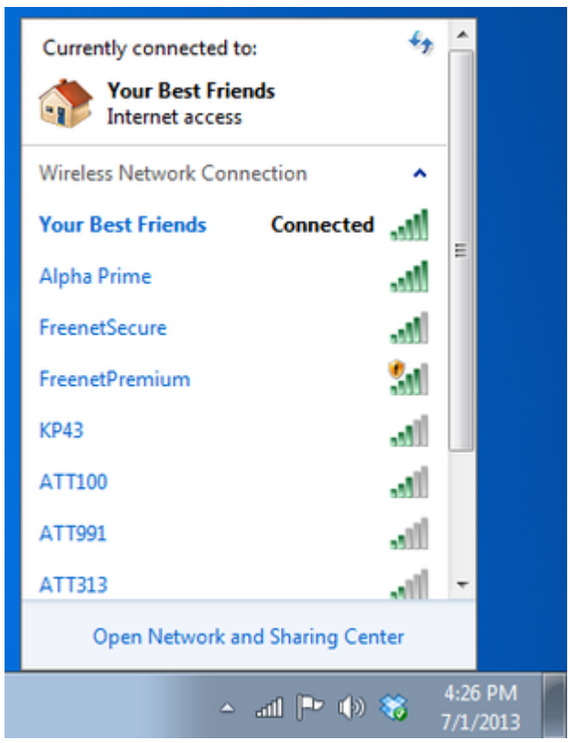
6) Update firmware

Updating the firmware on a router can fix major and minor flaws, as well as add new features. It should always been done when setting up a router. Additionally, If you ever experience weird issues in the future, you should check to see if the firmware is the most current version. Good manufacturers continue to update the firmware for their routers for a long time after the router is no longer in production.

It's often under an "advanced", "admin", or "tools" tab. After locating the firmware section, you will need to determine if it already has the most recent version installed. Also, don't assume that just because it's a new router it has the newest firmware.

7) Set wireless name/SSID

Every wireless network has a unique, customizable name, also called an SSID. When your computer shows you a list of all of the available networks, you're seeing the SSID (name) of each network. In the image below, you can see a list of available networks as displayed on Windows 7. You need to decide on a network name that is different than any other networks in your areainformation that could identify you, like your address.

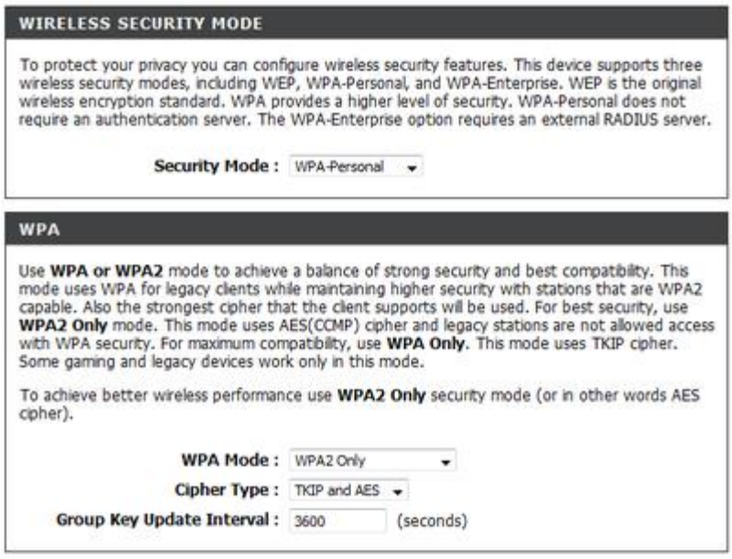


8) Set wireless security

Next, we need to set up security on your network for two reasons. First, to keep unwanted guests from logging on and using up your bandwidth.Second, to keep people from eavesdropping on your network activity and stealing important data.

Just like there are different wireless protocols (remember 802.11g, 802.11n, and 802.11ac?), there are different security options. WEP used to be used most often, but it is easily hacked and should be avoided. The next best option is WPA, which is far more secure than WEP. However, WPA2 is the newest and preferred security option. It might also be called “WPA2 – AES” in your router setup screen. Simply select it as the security type

Next, you need to choose a password. It can be between 8 and 63 characters. You can use a combination of uppercase and lowercase letters, numbers, and special characters.



Wireless Security Selection

Learning Objectives:

Understand the concept of wireless device.

Conclusion:

Ability to handle wireless device.

Questions:

1.What are different wireless devices used today?

2.What is SSID?

3.Define Modem and wireless router.

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EXPERIMENT NO. 31

Title: Identify wired network environment and its setup

Prior Concepts:

Proposition 1:

Use Wired connection instead of Wireless connection in Windows 8 / 7

In this tutorial we will see how we can change the priority of Network Connections in Windows 8 or Windows 7 and make them follow a desired connection order. You can make Windows 8 use Wired connection instead of Wireless connection.

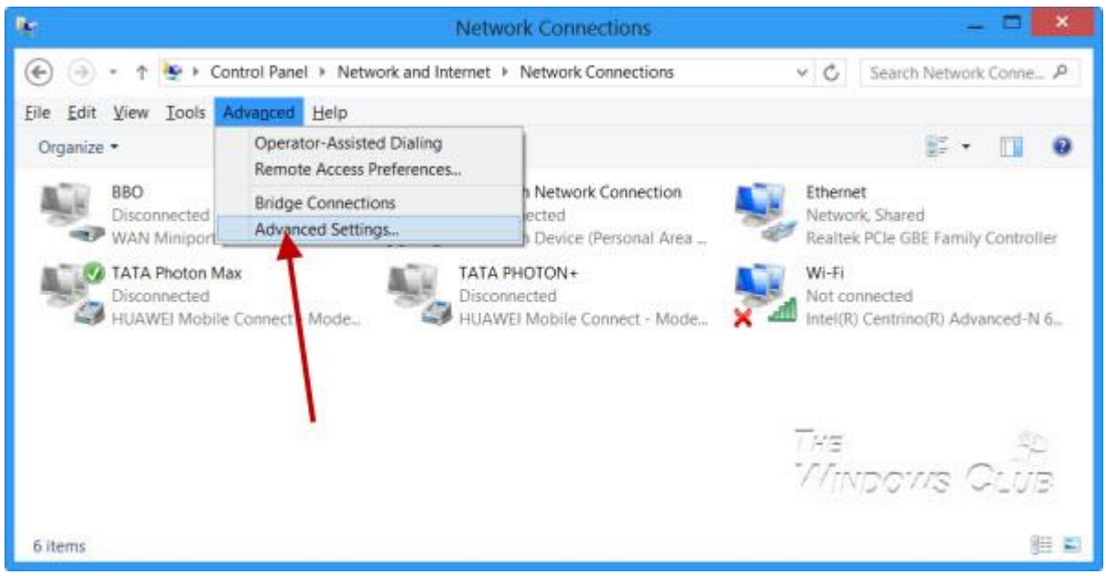
When you start your laptop, if there is a wireless connection available, your Windows laptop will connect to the Wi-Fi connection. Even if you connect to a wired connection, the usage will continue to be from the Wi-Fi connection. This is because, when more than one network connection is available, Windows uses the one with the lowest metric value.

Use Wired connection instead of Wireless

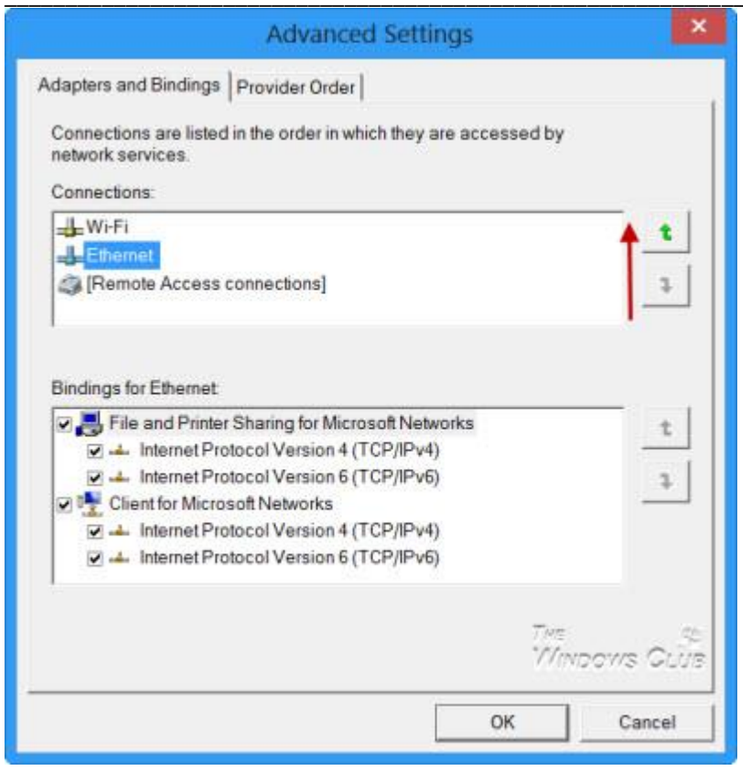
To change the Network Connection Priority, open Control Panel > Network and Internet > Network Connections.

Alternatively, if you are unable to find it, just open Control Panel and type *Network Connections* in the search box and press Enter. Under Network and Sharing Center, you will see **View network connections**. Click on it to open the following window.

Now click on the **Alt key** to make the Menu bar appear.



Click on Advanced Settings. This will open its Properties box.



Under the Adapters and Bindings tab, you will see the list of connection and their order in which they are accessed by Network Connections and other related Windows services. The default is Wi-Fi, Ethernet and then Remote Access. The Network Connections service manages objects in the Network and Dial-Up Connections folder, in which you can view both local area network and remote connections.

Using the Up and Down arrows, you can change their order, and set it according to your priority. When you change the setting as shown above and make Ethernet as the first choice, your laptop will use the wired connection first by choice.

Click OK and Exit.

Your Windows PC will now follow this order of priority when detecting available network connections.

Learning Objectives:

Ability to handle wired network device.

Conclusion:

To change the Network Connection Priority, open _____

Questions:

1.What are the requirements to use wired connections?

2.Difference between wired and wireless connection?

3.Is it possible to use both wired and wireless connection?

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EXPERIMENT NO. 32

Title: Identify blue tooth based wireless mouse, keyboard and other devices.

New concepts:

Proposition 1: Connecting a Bluetooth Mouse on Windows 10

Open the Start menu. You can do so either by clicking the Windows icon in the bottom-left corner of the screen, or by pressing the ⊞ Win key on your computer's keyboard.

Click ⚙. It's near the bottom-left corner of the Start window.

Click Devices. This option is near the middle of the page.

Click Bluetooth & other devices. It's on the left side of the page.

Click the switch beneath the "Bluetooth" heading. Doing so will enable Bluetooth on your Windows 10 computer.

Turn on your mouse. To do so, you'll need to locate the "On/Off" switch, which is typically found on the underside of the mouse, and slide it to the "On" position.

- If your mouse uses batteries, you should also make sure it has a fresh set. The battery compartment is also usually on the underside of the mouse.

Press the 'Pairing' button on your mouse. Some bluetoothmouse have a pairing button that must be pressed after the mouse is powered on before it will be visible to the computer.

- Consult the user manual to find out if your mouse has a pairing button and where it is located.

Look for the mouse's name. After a few seconds, it should appear beneath a "Mouse, keyboard, & pen" heading on your computer.

- If the mouse doesn't appear, turn your computer's Bluetooth off and then on again.

Click the mouse's name, then click Pair. This option is in the bottom-right corner of the mouse's name area. Doing so will add your mouse to your computer's Devices list, and you'll be able to use it without re-pairing it from then on.

Proposition2:

A *Bluetooth keyboard* is a wireless keyboard that connects and communicates with its parent device via the Bluetoothprotocol. These devices are widely used with such portable devices as smart phones and tablets, though they are also used with laptops and ultrabooks. Bluetooth keyboards became popular in 2011, coincident with the popularity of portable devices.

Most bluetooth keyboards have standard qwerty layouts, though some mini bluetooth keyboards may have a different layout. Bluetooth keyboards are compatible with all the leading operating systems such as Android, iOS, Linux, macOS, and Windows. Since they are used primarily for portable devices bluetooth keyboards have special function keys for Android and iOS operating systems. Most bluetooth keyboards, except a few, are not compatible across operating systems, so compatibility of the keyboard needs to be checked before purchasing one; this is because of the special function keys which differ between Android and iOS.

Learning Objectives:

Understand the use of wireless device.

Conclusion:

A ----------isa wireless keyboard that connects and communicates with its parent device via the Bluetoothprotocol

Questions:

1.Technology is used to avoid interference in Bluetooth?

2.ExplainCharacteristics of Bluetooth.

3. Differences between Bluetooth and Wi-Fi.

4.State use of wireless devices.

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