Model Viva Questions for**: ELECTRONIC WORKSHOP LAB**

Common to: **3Rd SEM CSE**

Title of practical: - Identify the various types of Resistors and find out the values from color bands printed on them...

Q.1 what is importance of colours coding resistor?
A1: The electronic color code is used to indicate the values or ratings of electronic components, very commonly for resistors, but also for capacitors, inductors, and others. A separate code, the 25-pair color code, is used to identify wires in some telecommunications cables

Q.2 why we use Resistance?
A2: - To protect ckt from high value of current.

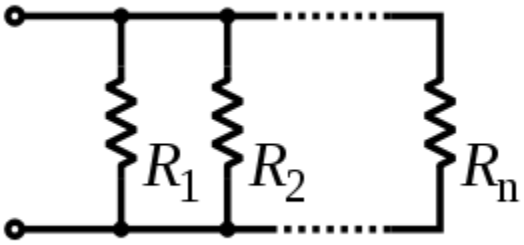
Q.3If voltage & current given then how we calculate the value of resistance?
A3: - R=V/I

Q4 what is common between inductor & resistor?
A4: - inductor is a passive device & resistor is a passive device.

Q5 what is resistor?
A5:- A resistor is a two-terminal electronic component that produces a voltage across its terminals that is proportional to the electric current through it in accordance with Ohm's law: $V = IR$

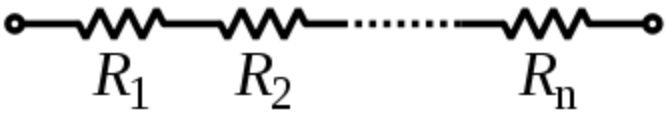
Q6 How parallel connection is done in resistor?
A6: - To find their total equivalent resistance (R_{eq}):

$$\frac{1}{R_{\text{eq}}} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots + \frac{1}{R_n}$$



Q7 how resistor connected in series?
A7: - To find their total resistance:

$$R_{\text{eq}} = R_1 + R_2 + \cdots + R_n$$



Q8 Write the equation for power dissipation in resistor?
A8: - The power dissipated by a resistor (or the equivalent resistance of a resistor network) is

$$P = I^2R = IV = \frac{V^2}{R}$$

Q9 what are features of carbon composition resistor?
A9 this type is also popular. It's made from a mixture of carbon powder and glue like binder. To increase the resistance, less carbon is added. These resistors show predictable performance, low inductance, and low capacitance. Power ratings range from about 1/4 to 2 W. Resistances range from 1 Ohm to about 100 MOhm, with tolerances around +/- 5 percent.

Q10 what are features of foil resistor?

A10 Foil resistors are similar in characteristics to metal film resistors. Their main advantages are better stability and lower temperature coefficient of resistance (TCR). They have excellent frequency response, low TCR, good stability, and are very accurate. They are manufactured by rolling the same wire materials as used in precision wire wound resistors to make thin strips of foil. This foil is then bonded to a ceramic substrate and etched to produce the value required. They can be trimmed further by abrasive processes, chemical machining, or heat treating to achieve the desired tolerance. Their main disadvantage is that the maximum value is less than metal film resistors. The accuracy is about the same as metal film resistors, the TCR and stability approaches precision wire wounds but are somewhat less because the rolling and packaging processes produce stresses in the foil. The resistive materials used in precision wire wound resistors are very sensitive to stresses, which result in instability and higher TCS. Any stresses on these materials will result in a change in the resistance value and TCR, the greater the stresses, the larger the change. This type can be used as strain gauges, strain being measured as a change in the resistance. When used as a strain gauge, the foil is bonded to a flexible substrate that can be mounted on a part where the stress is to be measured.

Title of practical: Find out the value of a resistance with the help of color-bands & by use of multimeter and observe the difference in values.

Q1What are wiring codes?

A1 Wires may be color-coded to identify their function, voltage class, polarity, and phase or to identify the circuit in which they are used. The insulation of the wire may be solidly colored, or where more combinations are needed, one or two tracer stripes may be added. Some wiring color codes are set by national regulations, but often a color code is specific to a manufacturer or industry.

Q2 Explain color coding with example?

A2 For example, a resistor with bands of *yellow, violet, red, and gold* will have first digit 4 (yellow in table below), second digit 7 (violet), followed by 2 (red) zeros: 4,700 ohms. Gold signifies that the tolerance is ±5%, so the real resistance could lie anywhere between 4,465 and 4,935 ohms. Resistors manufactured for military use may also include a fifth band which indicates component failure rate reliability.

Q3What are transformer codes?

A3 Power transformers used in North American vacuum-tube equipment often were color-coded to identify the leads. Black was the primary connection, red secondary for the B+ (plate voltage), red with a yellow tracer was the center tap for the B+ full-wave rectifier winding, green or brown was the heater voltage for all tubes, yellow was the filament voltage for the rectifier tube (often a different voltage than other tube heaters). Two wires of each color were provided for each circuit, and phasing was not identified by the color code.

Q4 what does the color bands signify?
ANS:- It is sometimes not obvious whether a color coded component is a resistor, capacitor, or inductor, and this may be deduced by knowledge of its circuit function, physical shape or by measurement. Resistor values are always coded in ohms (symbol Ω), capacitors in Pico farads (pF), and inductors in micro henries (μH).

To distinguish left from right there is a gap between the C and D bands.

- band **A** is first significant figure of component value (left side)
- band **B** is the second significant figure
- band **C** is the decimal multiplier
- Band **D** if present, indicates tolerance of value in percent (no color means 20%)

Q.5 In tolerance band how many colors are used?

A5 color in tolerance band

Q6 what is the basic of measuring resistance by multimeter?

A6 the basic idea is that the multimeter places a voltage at the two probes and this will cause a current to flow in the item for which the resistance is being measured. By measuring the resistance it is possible to determine the resistance between the two probes of the multimeter or other item of test equipment.

Q7 How resistance is measured with help of multimeter?

A7Measuring resistance with a digital multimeter is easier and faster than making a resistance measurement with an analogue multimeter as there is no need to zero the meter. As the digital multimeter gives a direct reading of the resistance measurement, there is also no equivalent of the reverse reading found on the analogue multimeters.There are a few simple steps required to make a resistance measurement with a digital multimeter:

Select the item to be measured: This may be anything where the resistance needs to be measured and estimate what the resistance may be.

1. Insert the probes into the required sockets often a digital multimeter will have several sockets for the test probes. Insert these or check they are already in the correct sockets. Typically these might be labeled COM

for common and the other where the ohms sign is visible. This is normally combined with the voltage measurement socket.

2. Turn on the multimeter

3. Select the required range The digital multimeter needs on and the required range selected. The range selected should be such that the best reading can be obtained. Normally the multimeter function switch will be labeled with the maximum resistance reading. Choose the one where the estimated value of resistance will be under but close to the maximum of the range. In this way the most accurate resistance measurement can be made.

4. Make the measurement with the multimeter ready to make the measurement the probes can be applied to the item that needs to be measured. The range can be adjusted if necessary.

5. Turn off the multimeter once the resistance measurement has been made, the multimeter can be turned off to preserve the batteries. It is also wise to turn the function switch to a high voltage range. In this way if the multimeter is used to again for another type of reading then no damage will be caused if it is inadvertently used without selecting the correct range and function.

Digital multimeters are ideal pieces of test equipment for measuring resistance. They are relatively cheap and they offer a high level of accuracy and general performance.

Q.8 Find the value of resistance black, red, green, gold?

A8- $3*10^7$ Ω

Q.9 How we can remember the sequence of color?

A9: - B.B.ROY of Great Britain has Very Good Wife.

Q.10 what method is used for finding resistance?

A10: - By Ohm’s law, .color coding and with multimeter.

Title of practical: Identify the various types of Capacitors and find out the values using color codes printed on them.

Q.1 capacitor is active device or passive device?

ANS: - passive

Q.2 capacitor store which type of energy?

ANS: - electrical energy

Q.3 capacitor allows flowing which type of current in it?

ANS: - A.C. current

Q.4 if two capacitor (c1, c2) connect in parallel then total capacitance is?

ANS: - $C_{eq.}$ = C1+C2

Q.5 formula for capacitor?

ANS: - C=Q/V

Q.6 what is difference between capacitor & inductor?

ANS: - capacitor store energy in the form of electrical energy where as inductor store energy in form of magnetic energy.

Q.7What is features of paper capacitor?

A7 Impregnated paper was extensively used for older capacitors, using wax, oil, or epoxy as an impregnant. Oil-Kraft paper capacitors are still used in certain high voltage applications. Has mostly been replaced by plastic film capacitors.

Q.8 what are features of electrolytic capacitor?

A8 Very large capacitance to volume ratio, inexpensive, polarized. Primary applications are as smoothing and reservoir capacitors in power supplies.

Q9 what are dielectric used in capacitors
A9 Air-gap: air-gap capacitors have a low dielectric loss. Large-valued, tunable capacitors that can be used for resonating HF antennas can be made this way.
Ceramic: the main differences between ceramic dielectric types are the temperature coefficient of capacitance, and the dielectric loss. C0G and NP0 (negative-positive-zero, i.e. ±0) dielectrics have the lowest losses, and are used in filters, as timing elements, and for balancing crystal oscillators. Ceramic capacitors tend to have low inductance because of their small size.

Q10 Explain construction of capacitor?
A10Capacitor have thin conducting plates (usually made of metal), separated by a layer of dielectric, then stacked or rolled to form a compact device. Many types of capacitors are available commercially, with capacitance ranging from the picofarad, microfarad range to more than a farad, and voltage ratings up to hundreds of kilovolts. In general, the higher the capacitance and voltage rating, the larger the physical size of the capacitor and the higher the cost. Tolerances in capacitance value for discrete capacitors are usually specified as a percentage of the nominal value. Tolerances ranging from 50% (electrolytic types) to less than 1% are commonly available. Another figure of merit for capacitors is stability with respect to time and temperature, sometimes called *drift*. Variable capacitors are generally less stable than fixed types.

Title of practical: - Identify the terminals of a Diode and its Polarity.

Q1: Explains Insulator, metal and semiconductor?

A1: Insulator: - insulator is a material which does not allow to flow of current trough itself is called insulator. Example: - wood, glass etc

Conductor: - metal is a material which allow to flow of current trough itself is called Conductor. Example: - Al, Ag, Steel etc.

Semiconductor: - a semiconductor is a material which has the resistivity in between semiconductor and insulator. Example: - Ge, Si, and C etc

Q2: What is silicon and germanium?

A2: Solid state electronics arises from the unique properties of silicon and germanium, each of which has four valence electrons and which form crystal lattices in which substituted atoms (dopants) can dramatically change the electrical properties.

Q3: Difference between silicon and germanium?

A3: In solid state electronics, either pure silicon or germanium may be used as the intrinsic semiconductor which forms the starting point for fabrication. Each has four valence electrons, but germanium will at a given temperature have more free electrons and a higher conductivity. Silicon is by far the more widely used semiconductor for electronics, partly because it can be used at much higher temperatures than germanium. For silicon diodes, the built-in potential is approximately 0.7 V and 0.3 V for Germanium

Q4: What do you mean by a Diode?

A4: when a p-type semiconductor is joint with an n-type semiconductor through VLSI technology then the resulting device is called pn junction diode. Diode is an electronics component having two terminals, cathode &anode, having non-linear characteristic end allowing the flow current in only 1 direction. The semiconductor diode is formed by forming a junction between P-type & other N-type of semiconductor. Diodes can have more complicated behavior than this simple on-off action.

Q5: Explains the forward biasing of pn junction diode?

A5: Forward biased: - when p type semiconductor is connected to the +ve terminal of the battery and n type material is connected to the –ve terminal of the battery then diode is called forward biased. At this condition, if the applied voltage is greater than the barrier potential of the diode, it starts conduction. After the diode is arrived in the conduction mode, the drop across it remains at 0.7 V. After the conduction starts, if the voltage is increased further, current trough it increases linearly with voltage.

Q6: Explains the reverse biasing of pn junction diode?

A6: Reverse biased: - when p type semiconductor is connected to the -ve terminal of the battery and n type material is connected to the +ve terminal of the battery then diode is called Reverse biased. Here there is no conduction at lower voltage values. If we increase the voltage value further, it is observed that at a voltage the current sharply increases due to the breakdown of the P-N junction.

Q7: What are the knee and breakdown voltages?

A7: Knee voltage is defined as the forward voltage at which barrier is removes and current through the junction starts increasing rapidly.

Breakdown voltage is defined as the reverse voltage at which barrier is removed and inverse current through the junction starts increasing rapidly. It can be damages the diode.

Q8: What is voltage- Current (V-I) characteristics of diode?

A8: A semiconductor diode's behavior in a circuit is given by its current–voltage characteristic, or I–V graph .The shape of the curve is determined by the transport of charge carriers through the so-called depletion layer. In forward biasing after knee voltage current increase sharply and in reverse biasing small leakage current flow and after reverse breakdown voltage sharply inverse current will flow.

Q9: Testing of silicon diode using multimeter?

A9: To check an ordinary silicon diode using a digital multimeter. Connect the positive lead of multimeter to the anode and negative lead to cathode of the diode. If multimeter displays a voltage between 0.6 to 0.7, we can assume that the diode is healthy. This is the test for checking the forward conduction mode of diode. Now connect the positive lead of multimeter to the cathode and negative lead to the anode.

Q10: Testing of germanium diode using a digital multimeter?

A10: For testing Germanium diodes, the procedure is same but the display will be between 0.25 to 0.3 V to indicate a healthy condition in the forward biased mode. The potential barrier for Germanium diode is between 0.25 and 0.3V.When reverse biased the multimeter will show an infinite reading (over range) indicate healthy condition.

Title of the Practical: Identify the terminals of a Transistor and its type (N-P-N or P-N-P).

Q1: What is a transistor?
A1: A junction transistor is simply a sandwich of one type of semiconductor material between two layers of the other type. A transistor is a three terminal current sensing device. It can be looked upon as two pn junction placed back to back. The three terminals are named as emitter base & collector.

Q2: What are the types of transistor?
A2: The transistor may be NPN or PNP type
An NPN bipolar transistor is so called because the outer layers are N-type semiconductors, while the base is a P-type. N stands for negative charge carriers or electrons, and P for positive charge carriers or holes

Q3: What are the different configurations of transistor?
A3: A transistor may be connected in three configurations namely:

a) Common Emitter (CE)
b) Common Base (CB)
c) Common collector (CC)

Q4: What is the meaning of term "Common"?
A4: The term common is used to denote the element that is common to both input and output circuits. Because the common element is often grounded, these configurations are frequently referred to as grounded emitter, grounded base, and grounded collector.

Q5**:** What are the characteristics o f each configuration that make it suitable for specific applications?
A5: Each configuration has particular characteristics that make it suitable for specific applications. An easy way to identify a specific transistor configuration is to follow three simple steps:
1) Identify the element (emitter, base, or collector) to which the input signal is applied.
2) Identify the element (emitter, base, or collector) from which the output signal is taken.
3) The remaining element is the common element, and gives the configuration its name.

Q6: What is Common Base configuration?
A6: The common-base configuration (CB), base is common between input and output circuits. In emitter-base terminal input signal is applied and in collector-base terminal output is taken from it.

Q7: What are the characteristics of CB?
A7: since it has a low input resistance (30 ohms-160 ohms) and a high output resistance (250 kilohms-550 kilohms). However, two factors limit its usefulness in some circuit applications: (1) its low input resistance and (2) its current gain of less than 1. Since the CB configuration will give voltage amplification, and use in some microphone amplifiers. The input and output signals in the common-base circuit are in phase

Q8: What is current gain for CB?
A8: The current gain in the common-base circuit is the ratio of change in collector current (output current) to the change in emitter current (input current) at constant V_{CB}. The term ALPHA (α) is used for gain. Alpha is calculated using the formula:

Q9: What is input characteristic of CB?
A9: Input Characteristics, a graph of the base current I_E versus V_{BE} with constant V_{CB} , which is the voltage between the base and the collector, looks like that of an ordinary diode. I_E increases rapidly with small increase in $V_{BE.}$ The I_E is almost independent of $V_{CB.}$

Q10: Output Characteristics of CB configuration?
A10: Output characteristics are found by considering the collector loop. A graph of the collector current I_C versus the collector-base voltage V_{CB} with constant I_E. The I_C varies with V_{CB} only at very low voltages (< 1 v). Beyond this value I_C became constant and dependent upon only I_E . A very large change in produces only a tiny change in the

Title of practical: Check the continuity of a printed line on a PCB using multi-meter

Q1What is multimeter?

A1A multimeter or a multitester, also known as a volt/ohm meter or VOM, is an electronic measuring instrument that combines several measurement functions in one unit. A typical multimeter may include features such as the ability to measure voltage, current and resistance. Multimeters may use analog or digital circuits—analog multimeters and digital multimeters (often abbreviated DMM or DVOM.) Analog instruments are usually based on a micro ammeter whose pointer moves over a scale calibration for all the different measurements that can be made; digital instruments usually display digits, but may display a bar of a length proportional to the quantity measured.

Q2What are application of multimeter?

A2 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.

Q3What quantities are measured using multimeter?

A3Voltage, alternating and direct, in volts. Current, alternating and direct, in amperes.
The frequency range for which AC measurements are accurate must be specified. Resistance in ohms.

Additionally, some multimeters measure: Capacitance in farads. Conductance in siemens.Decibels. Duty cycle as a percentage.

Q4How resolution is specified?

A4The resolution of a multimeter is often specified in "digits" of resolution. For example, the term 5½ digit refers to the number of digits displayed on the display of a multimeter.

By convention, a half digit can display either a zero or a one, while a three-quarters digit can display a numeral higher than a one but not nine. Commonly, a three-quarters digit refers to a maximum value of 3 or 5. The fractional digit is always the most significant digit in the displayed value. A 5½ digit multimeter would have five full digits that display values from 0 to 9 and one half digits that could only display 0 or 1. Such a meter could show positive or negative values from 0 to 199,999. A 3¾ digit meter can display a quantity from 0 to 3,999 or 5,999, depending on the manufacturer.

Q5Compare analog and digital multimeter in terms of accuracy?

A5Accuracy figures need to be interpreted with care. The accuracy of an analog instrument usually refers to full-scale deflection; a measurement of 10V on the 100V scale of a 3% meter is subject to an error of 3V, 30% of the reading. Digital meters usually specify accuracy as a percentage of reading plus a percentage of full-scale value, sometimes expressed in counts rather than percentage terms.

Q6What is burden voltage?

A6Any ammeter, including a multimeter in a current range, has a certain resistance. Most multimeters inherently measure voltage, and pass a current to be measured through a shunt resistance, measuring the voltage developed across it. The voltage drop is known as the burden voltage, specified in volts per ampere.

Q7What are different types of probes used in multimeter?

A7A multimeter can utilize a variety of test probes to connect to the circuit or device under test. Crocodile clips, retractable hook clips, and pointed probes are the three most common attachments. Tweezers probes are used for closely-spaced test points, as in surface-mount devices. The connectors are attached to flexible,

thickly-insulated leads that are terminated with connectors appropriate for the meter. Probes are connected to portable meters typically by shrouded or recessed banana jacks, while bench top meters may use banana jacks or BNC connectors. 2mm plugs and binding posts have also been used at times, but are less common today.

Q8 what are applications of DMM?

A8 A general-purpose DMM is generally considered adequate for measurements at signal levels greater than one mill volt or one mill ampere, or below about 100 megohms—levels far from the theoretical limits of sensitivity.

Q9 How continuity is checked in multimeter?

A9 One important measurement that can be made with a multimeter is a resistance measurement. Not only can these be made to check the accuracy of a resistor, or check it is functioning correctly, but resistance measurements can be required in many other scenarios as well. It may be to measure the resistance of an unknown conductor, or it may be to check for short circuits and open circuits. In fact there are many instances where measuring resistance is of great interest and importance. In all these cases a multimeter is an ideal piece of test equipment for measuring resistance

Q10 what are scales present in multimeter?

A10Additional scales such as decibels, and functions such as capacitance, transistor gain, frequency, duty cycle, display hold, and buzzers which sound when the measured resistance is small have been included on many multimeters. While multimeters may be supplemented by more specialized equipment in a technician's toolkit, some modern multimeters include even more additional functions for specialized applications

Title of practical: Identify the various tools, connector & Instruments/ Equipments.

Q1: What is zener diode?
ANS: Zener diode is a P-N junction diode specially designed to operate in the reverse biased mode.
It is acting as normal diode while forward biasing. It has a particular voltage known as break down voltage or "Zener knee voltage" or "Zener voltage", at which the diode break downs while reverse biased. In the case of normal diodes the diode damages at the break down voltage.

Q2: who discovered the zener diode?
A2: The device was named after Clarence Zener, who discovered this electrical property.

Q3: What is the basic principle of zener diode?
A3: The basic principle of zener diode is the zener breakdown. When a diode is heavily doped, it's depletion region will be narrow. When a high reverse voltage is applied across the junction, there will be very strong electric field at the junction. And the electron hole pair generation takes place. Thus heavy current flows. This is known as Zener break down. In reverse biased mode, after the break down of junction current through diode increases sharply. But the voltage across it remains constant.

Q4 what is multimeter?

A4 A multimeter or a multitester, also known as a volt/ohm meter or VOM, is an electronic measuring instrument that combines several measurement functions in one unit. A typical multimeter may include features such as the ability to measure voltage, current and resistance. Multimeters may use analog or digital circuits—analog multimeters and digital multimeters (often abbreviated DMM or DVOM.) Analog instruments are usually based on a micro ammeter whose pointer moves over a scale calibration for all the different measurements that can be made; digital instruments usually display digits, but may display a bar of a length proportional to the quantity measured.

Q5What is CRO?

A5The cathode-ray oscilloscope (CRO) is a common laboratory instrument that provides accurate time and amplitude measurements of voltage signals over a wide range of frequencies. Its reliability, stability, and ease of operation make it suitable as a general purpose laboratory instrument

Q6 what is lissajous pattern in CRO?

A6 When sine-wave signals of different frequencies are input to the horizontal and vertical amplifiers a stationary pattern is formed on the CRT when the ratio of the two frequencies is an intergral fraction such as 1/2, 2/3, 4/3, 1/5, etc. These stationary patterns are known as *Lissajous figures* and can be used for comparison measurement of frequencies.

Q7 what are different sections in CRO?

A7 the basic oscilloscope, as shown in the illustration, is typically divided into four sections: the display, vertical controls, horizontal controls and trigger controls. The display is usually a CRT or LCD panel which is laid out with both horizontal and vertical reference lines referred to as the graticule. In addition to the screen, most display sections are equipped with three basic controls, a focus knob, an intensity knob and a beam finder button.

Q8 How input is fed to CRO?
A8 The signal to be measured is fed to one of the input connectors, which is usually a coaxial connector such as a BNC or UHF type. Binding posts or banana plugs may be used for lower frequencies. If the signal source has its own coaxial connector, then a simple coaxial cable is used; otherwise, a specialized cable called a "scope probe", supplied with the oscilloscope.

Q9 Define connector?

A9 an electrical connector is a conductive device for joining electrical circuits together. The connection may be temporary, as for portable equipment, or may require a tool for assembly and removal, or may be a permanent electrical joint between two wires or devices. There are hundreds of types of electrical connectors. In computing, an electrical connector can also be known as a physical interface.

Q10 Define Keying?

A10 Many connectors are **keyed,** meaning that they have some component which prevents mating except with specific connectors or in a specific orientation. This can be used to prevent incorrect or damaging interconnections, either preventing pins from being damaged by being jammed in at the wrong angle or fitting into imperfectly fitting plugs, or to prevent damaging connections, such as plugging an audio cable into a power outlet. For instance, XLR connectors have a notch to ensure proper orientation, while Mini-DIN plugs have a plastic projection, which fits into a corresponding hole in the socket and prevent different connectors from being pushed together (they also have a notched metal skirt to provide secondary keying

Title of the Practical: Identify the various types of Copper-Clads and draft the

FW-Rectifier circuit

Q1: What is the rectifier?

A1: The process of converting A.C. voltage into D.C. voltage which is in only one direction, a process known as rectification is called rectification and it is done by rectifier.

Q2: What is the application of rectifier?
A2: Rectifiers have many uses including as components of power supplies and as detectors of radio signals. Rectifiers may be made of solid state diodes, vacuum tube diodes, mercury arc valves, and other components. Rectifiers also find a use in detection of amplitude modulated radio signals

Q3: What is the type of rectifier?
A3: There are two type of rectifier:-

1. Half wave rectifier 2. Full wave rectifier:- center tape full wave
   Bridge full wave

Q4: What is the ripple factor of the rectifier?
A4: The ripple factor of the rectifier: - Half wave recitifer:-1.21, Center tape wave rectifier:-0.48
Bridge full wave:-0.48

Q5: What is the PIV of all type rectifiers?
A5: The PIV of rectifier: - Half wave rectifier=Vm, Center tape wave rectifier=2Vm
Bridge full wave=Vm

Q6: Half wave rectifier?
A5: In a half wave rectifier only one half cycle of ac voltage is taking. The circuit is given. Here only one diode is using. During the positive half cycle of ac voltage the diode conducts. So current flows through load. During the negative half cycle, the diode is reverse biased .So no current flows through the diode. Half-wave rectification can be achieved with a single diode in a one-phase supply, or with three diodes in a three-phase supply.
Q7: Full wave bridge rectifier?
A7: Full wave bridge rectifier: In full wave bridge rectifiers 4 diodes are using. During positive half cycle, D1 and D4 are in forward biased condition. In the negative half cycle of ac D3 and D2 are in forward biased condition. So in both the half cycles current through the load is in single direction. This circuit does not need a centre tap rectifier. But it requires more number of diodes than centre tap and half wave rectifiers
Q8: Full wave centre tap rectifier?
A8: In this method only two diodes are using. But it requires a center tap transformer. During the positive half cycle diode D1 conducts. In the negative half cycle diode D2 conducts. So in both half cycles current flowing through load in same direction. Full-wave rectification converts both polarities of the input waveform to DC (direct current), and is more efficient.

Q9: Why we use Filter?
A9: While half-wave and full-wave rectification suffice to deliver a form of DC output, neither produces constant-voltage DC. In order to produce steady DC from a rectified AC supply, a smoothing circuit or filter is required. In its simplest form this can be just a reservoir capacitor or smoothing capacitor, placed at the DC output of the rectifier. There will still remain an amount of AC ripple voltage where the voltage is not completely smoothed.

Q10: Difference between half wave and full wave rectifier?
A10: The efficiency of half wave rectifier is not as good as that of full wave rectifier Because only one half of the input waveform reaches the output, it is very inefficient if used for power transfer. The ripples are

maximum in the single phase half-wave rectifier and being reduced in the full-wave rectifier and being reduced further with the increase in the number of phases.

Title of practical: Solder the joint connection of wires and check it. De-solder and Re-solder it.

Q1Define solder?
A1 solder is a fusible metal alloy with a melting point or melting range of 90 to 450 degree Celsius (190 to 840 °F), used in a process called soldering where it is melted to join metallic surfaces. It is especially useful in electronics and plumbing.
Q2 Define soldering?
A2 Soldering is a process in which two or more metal items are joined together by melting and flowing a filler metal into the joint, the filler metal having a relatively low melting point
Q3 what is the difference between soldering and brazing?
A3 Soldering is distinguished from brazing by use of a lower melting-temperature filler metal. The filler metals are typically alloys that have liquidus temperatures below 350°C. It is distinguished from welding by the base metals not being melted during the joining process which may or may not include the addition of a filler metal.[2] In a soldering process, heat is applied to the parts to be joined, causing the solder to melt and be drawn into the joint by capillary action and to bond to the materials to be joined by wetting action.
Q4What are application of soldering?

A4 One of the most frequent applications of soldering is assembling electronic components to printed circuit boards (PCBs). Another common application is making permanent but reversible connections between copper pipes in plumbing systems. Joints in sheet metal objects such as food cans, roof flashing, rain gutters and automobile radiators have also historically been soldered, and occasionally still are. Jewelry components are assembled and repaired by soldering. Small mechanical parts are often soldered as well. Soldering is also used to join lead came and copper foil in stained glass work. Soldering can also be used as a semi-permanent patch for a leak in a container or cooking vessel.

Q5 what is the use of flux?

A5 In high-temperature metal joining processes (welding, brazing and soldering), the primary purpose of flux is to prevent oxidation of the base and filler materials. Tin-lead solder, for example, attaches very well to copper, but poorly to copper oxides (which form quickly at soldering temperatures). Flux is nearly inert at room temperature, yet becomes strongly reductive when heated. This helps remove oxidation from the metals to be joined, and inhibits oxidation of the base and filler materials. Secondarily, flux acts as a wetting agent in the soldering process, reducing the surface tension of the molten solder and causing it to better wet out the parts to be joined.

Q6What is the soldering method in PCB?

A6 Currently, mass-production printed circuit boards (PCBs) are mostly wave soldered or reflow soldered, though hand soldering of production electronics is also still standard practice for many tasks

Q7 what is hot bar reflow?

A7 *Hot-bar reflow* is a selective soldering process where two pre-fluxed, solder coated parts are heated with heating element (called a thermode) to a sufficient temperature to melt the solder.

Q8 Define laser soldering?

A8 *Laser soldering* is a technique where a ~30-50 W laser is used to melt and solder an electrical connection joint. Diode laser systems based on semiconductor junctions are used for this purpose.

Q9 Define Solderability?

A9 the Solderability of a substrate is a measure of the ease with which a soldered joint can be made to that material.

Q10What are soldering tools?

A10 Hand-soldering tools include the electric soldering iron, which has a variety of tips available ranging from blunt to very fine to chisel heads for hot-cutting plastics, and the soldering gun, which typically provides more power, giving faster heat-up and allowing larger parts to be soldered. Hot-air guns and pencils allow rework of component packages which cannot easily be performed with electric irons and guns.

Soldering torches are a type of soldering device that uses a flame rather than a soldering iron tip to heat solder. Soldering torches are often powered by butane[17] and are available in sizes ranging from very small butane/oxygen units suitable for very fine but high-temperature jewelry work, to full-size oxy-fuel torches suitable for much larger work such as copper piping. Common multipurpose propane torches, the same kind used for heat-stripping paint and thawing pipes, can be used for soldering pipes and other fairly large objects (but not electronics,) either with or without a soldering tip attachment; pipes are generally soldered with a torch by directly applying the open flame.