

**A**

**PROJECT REPORT ON  
“CELL PHONE CHARGER”**

**SUBMITTED TO: -**

**ROORKEE COLLEGE OF ENGINEERING**

**SUBMITTED BY: -**

**SANDEEP MAURYA**



**DEPARTMENT OF  
ELECTRONICS AND COMMUNICATION ENGINEERING  
ROORKEE COLLEGE OF ENGINEERING,  
ROORKEE, UTTRAKHAND**



**PROJECT REPORT ON  
“CELL PHONE CHARGER”**

**SUBMITTED BY: -**

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## **ABSTRACT**

Every electronics circuit such as amplifiers, battery chargers, needs a DC power source for its operation. The DC voltage has to be obtained from the AC supply. For this the AC supply voltage has to be reduced (step down) first using a step down transformer and then converted to DC by using a rectifier.

A step down transformer is used to reduce the AC mains voltage to an adequately small value. The turns ratio of the transformer is adjusted to obtain a stepped down AC voltage.

This voltage is converted into a pulsating DC voltage by the rectifier. The type of rectifier used are half wave rectifier, full wave rectifier or bridge rectifier.

This pulsating DC voltage at the rectifier output is converted into a ripple free steady DC voltage by the filter circuit. The ripple or the AC part in the voltage in the voltage is minimized by the filter.

The filtered DC voltage is then applied to a voltage regulator which tries to keep the DC output voltage constant even if the supply voltage or load fluctuations take place.

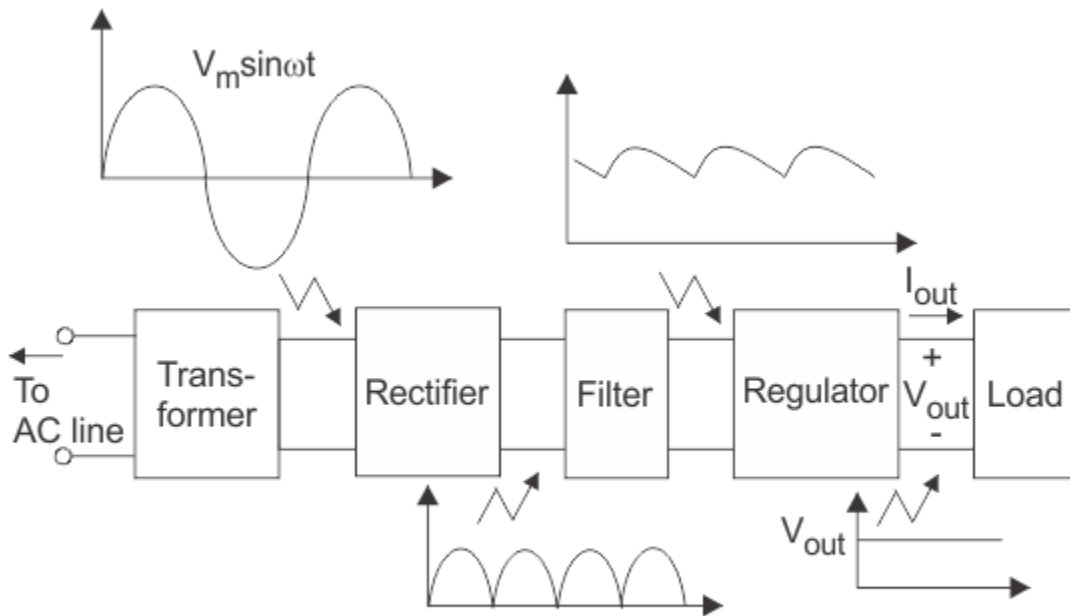
## **TOPIC:-**

### **Cell Phone Charger**

#### **NEED OF POWER SUPPLY:-**

Every electronics circuit such as amplifiers, battery chargers, needs a DC power source for its operation. The DC voltage has to be obtained from the AC supply. For this the AC supply voltage has to be reduced (step down) first using a step down transformer and then converted to DC by using a rectifier. A *power supply* is an electrical device that supplies electric power to an electrical load. The primary function of a *power supply* is to convert electric current from a source to the correct voltage, current, and frequency to power the load. As a result, *power supplies* are sometimes referred to as electric power converters.

## **BLOCK DIAGRAM OF A REGULATED POWER SUPPLY:-**



Components of typical linear power supply

## **OPERATION:-**

The basic building block of a regulated DC power supply are:-

- A step down transformer
- A rectifier
- Filter
- Voltage regulator

A step down transformer is used to reduce the Ac mains voltage to adequately small value. The turns ratio of the transformer is adjusted to obtain a stepper down Ac voltage.

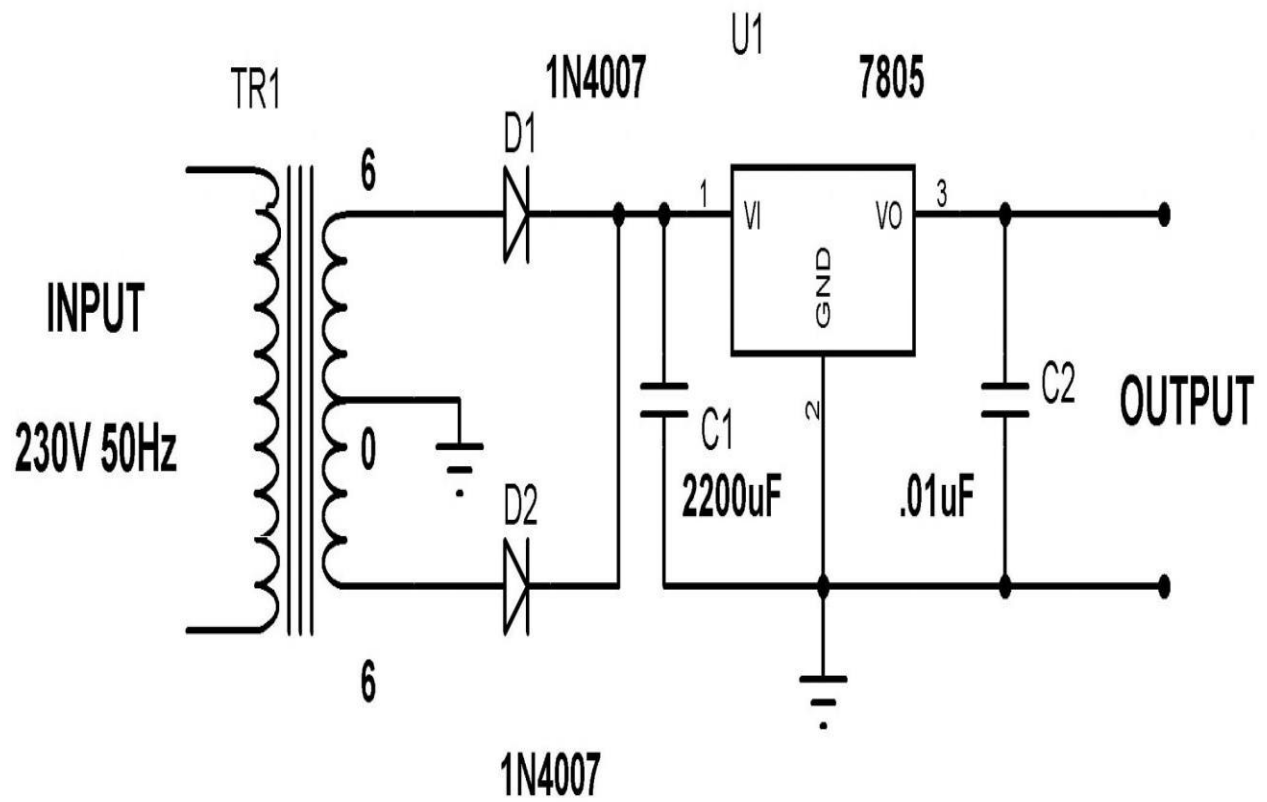
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# CIRCUIT DIAGRAM:-



## **POLARITIES OF TRANSFORMER:-**

### **Single supply Ac voltage:-**

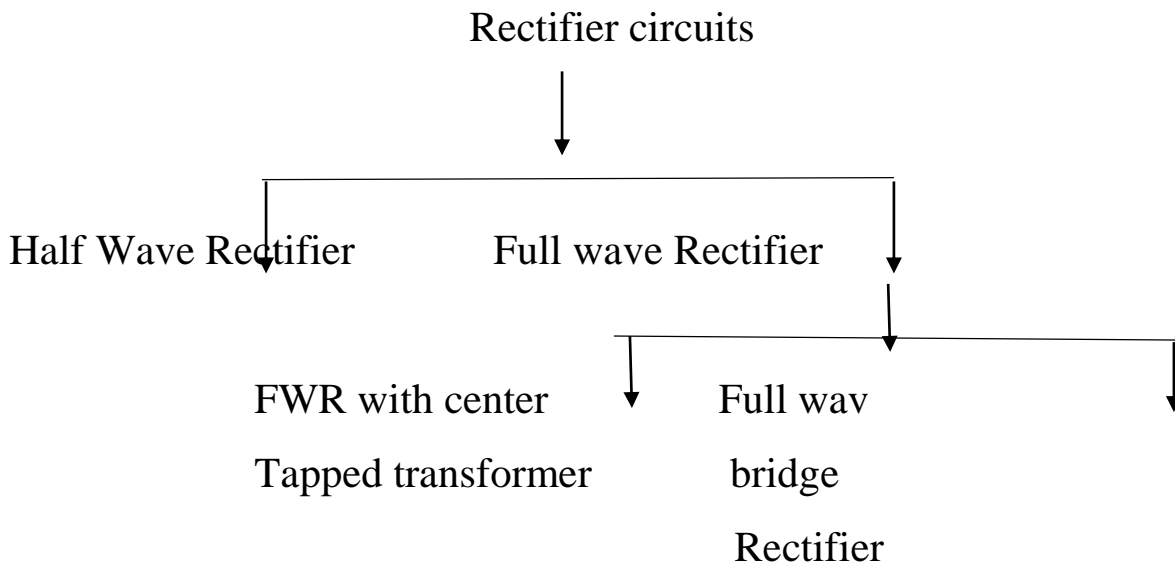
The primary of a transformer is connected to the single phase Ac supply available from MSEB. This supply voltage has two terminals namely **live** and **natural**. And the voltage at the live terminal with respect to natural is sinusoidal.

The positive half cycle extends from  $\omega t = 0$  to  $\pi$  radians. In thi half cycle **Live (L)** is positive with respect to **Natural (N)** and the secondary voltage  $V_{ab}$  is positive.

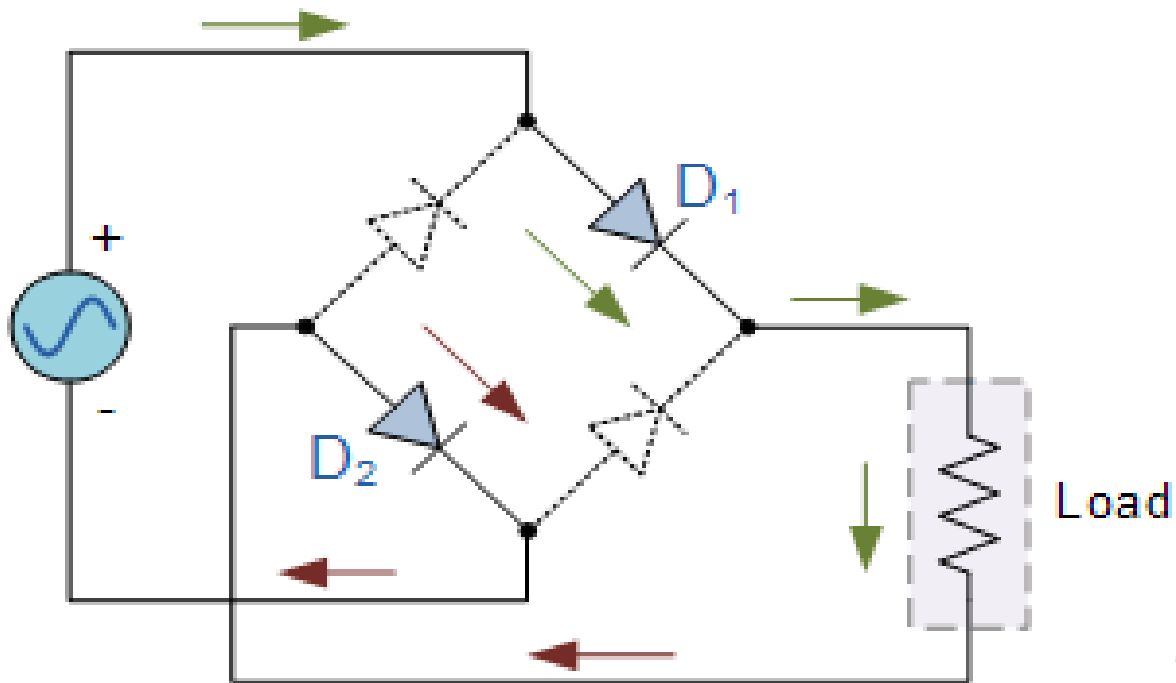
The negative half cycle extends from  $\omega t = \pi$  to  $2\pi$  radians. L is negative with respect to N and secondary voltage  $V_{ab}$  is negative.

## **RECTIFIER:-**

Rectifier is a circuit which converts an alternating(ac) voltage into a direct(dc) voltage. The classification of rectifier configuration is as shown follow:-



## FULL WAVE RECTIFIER:-



The circuit diagram of full wave rectifier is shown above. It consists of 4 diodes connected to form a bridge. Bridge rectifier offers full wave rectification. The diodes conduct in pairs that is at any given instant of time, one pair of diodes either  $D_1 D_2$  or  $D_3 D_4$  will be conducting.

Operation of the bridge rectifier can be explained in two half cycles of the AC supply voltage as follows:

### **Operation of positive half cycle:**

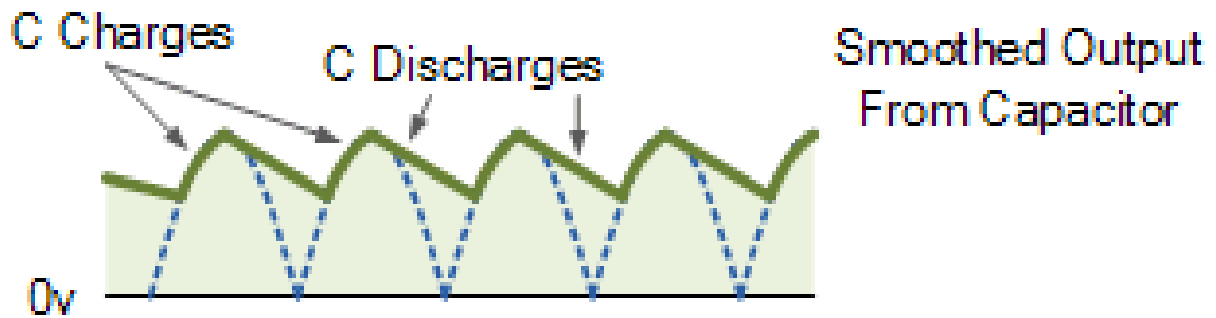
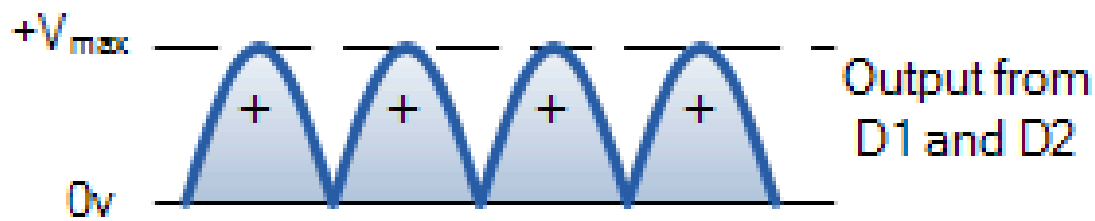
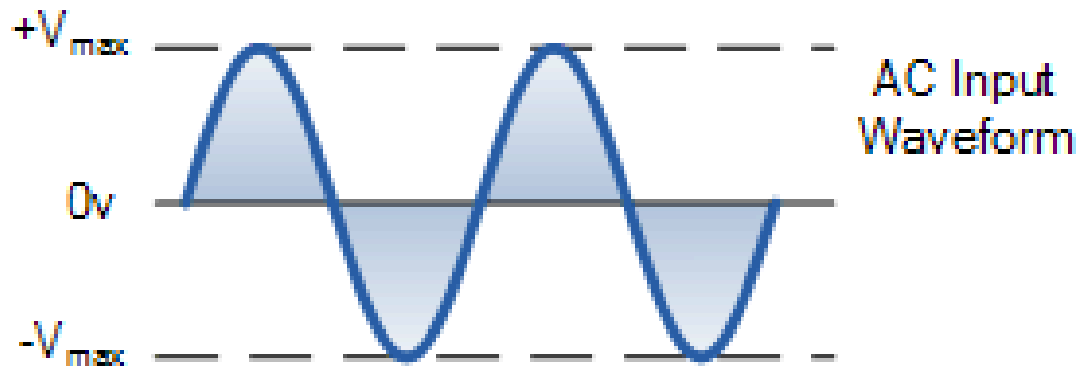
In the positive half cycle of the ac supply the secondary voltage  $V_{ab}$  is positive. Therefore diodes D1 and D2 are forward biased whereas D3 and D4 are reverse biased. The reversed biased diode D3 and D4 act as an open circuit. The load current and load voltage both are positive.

### **Operation of negative half cycle:**

In the negative half cycle of the ac supply the secondary voltage  $V_{ab}$  becomes negative. Diode D3 and D4 are forward biased and start conducting.

D1 and D2 are reverse biased hence do not conduct.

The reverse biased diode D1 and D2 act as an open circuit.



## COMPONENTS REQUIRED:-

1. Transformer
2. Diodes
3. Capacitor
4. LM7805
5. Resistance
6. led
7. Connecting wire
8. Zero PCB

### 1. TRANSFORMER



In this project of regulated of power supply we use transformer of 12 volt. The transformer we are using is a step down transformer. This is because we are getting main supply of 220 volt this is very much so for that perpes we are using step down transformer. step down transformer steps the 220V.

### 2. DIODE.



A *diode* is a specialized electronic component with two electrodes called the anode and the cathode. The *definition* of a *diode* is an electronic device with two

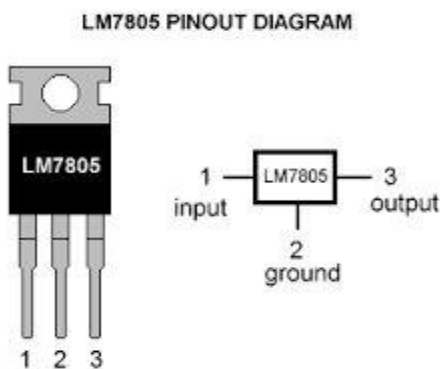
transmitting terminals that allows electric current to flow in one direction while blocking current in the opposite direction.

### 3. CAPACITOR.



The capacitor is a component which has the ability or capacity to store energy in the form of an electrical charge. In this project we are taking capacitor of 470 micro farad , 20 volt. In this capacitor is used to reduce the ripple contents in the output of the rectifier to obtain a pure dc voltage.

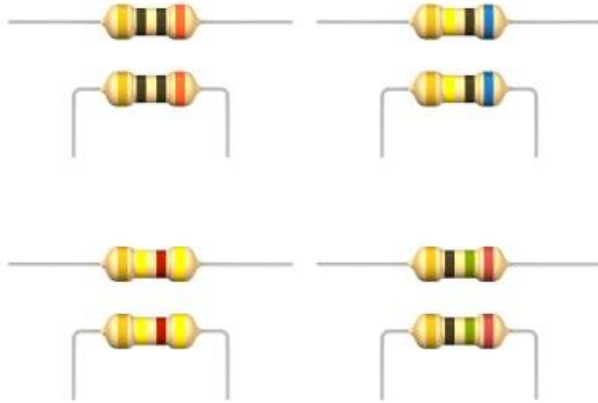
### 4. LM 7805.



A voltage regulator IC maintains the output voltage at a constant value. 7805 IC , a member of 78xx series of fixed linear voltage regulators used to maintain such fluctuations , is a popular voltage regulator integrated circuit. 7805 IC provides +5 volts regulated power supply.



## 5. RESISTANCE.



A **resistor** is an electrical component that limits or regulates the flow of electrical current in an electronic circuit. **Resistors** can also be used to provide a specific voltage for an active device such as a transistor. In this project we use resistor of  $330\Omega$ .

## 6. LED.



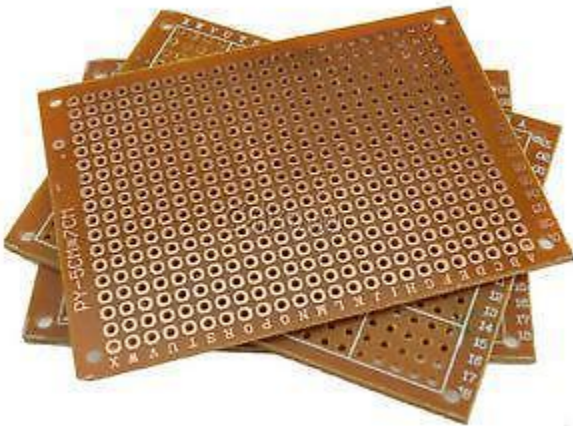
The use of LED in regulated power supply project is for indication or we can say it is simply a load which is connected to the last of the stage.

## 7. CONNECTING WIRE.



A *wire* is a long thin piece of metal that is used to fasten things or to carry electric current. *Wire* is commonly formed by drawing the metal through a hole in a die or draw plate.

## 8. ZERO PCB.



General Purpose **Zero PCB**. As its name suggests, general purpose **PCB's** are widely used to embed circuits randomly for running of hardware. Its layer is coated with copper and allows proper soldering without any short circuit. This is zero PCB it has copper patches so u can solder your components but doesn't have any connection so for connecting the components together either

solder the components together or connect them by soldering their legs to wire.