

Lab 05

[CLO-02 & 03, PLO-05 & 09, P3(Guided Response) & A2(Responding), Rubric (Simulation & Team Work)]

Introduction to DC power supply, designing and simulating the 12v DC power supply on Proteus

1. Introduction to DC Power Supply



A DC (Direct Current) power supply is an electrical device that converts alternating current (AC) from a power source, such as an electrical outlet, into direct current suitable for powering electronic devices. DC power supplies play a crucial role in providing a stable and regulated voltage to ensure proper operation of electronic circuits and components.

Here's a brief introduction to DC power supplies:

1. **Purpose:** The primary purpose of a DC power supply is to provide a constant and regulated DC voltage to electronic devices. This stability is essential for the reliable operation of various electronic components like integrated circuits, microcontrollers, and sensors.
2. **Types of DC Power Supplies:**
 - **Linear Power Supplies:** These use linear regulators to control the output voltage. They are simpler but less energy-efficient.
 - **Switched-Mode Power Supplies (SMPS):** These are more complex but offer higher efficiency by rapidly switching the input voltage on and off.
3. **Components:**
 - **Transformer:** Converts AC voltage from the main power source to a different voltage.
 - **Rectifier:** Converts AC to pulsating DC.

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- **Filter:** Smoothens the pulsating DC to reduce voltage ripple.
- **Regulator:** Maintains a constant output voltage.

4. Voltage Regulation:

- **Fixed Voltage Supplies:** Provide a constant, unchangeable voltage.
- **Variable Voltage Supplies:** Allow the user to adjust the output voltage within a specified range.

5. Applications:

- **Electronics Labs:** Used for testing and prototyping electronic circuits.
- **Electronic Devices:** Powering various devices such as routers, modems, and microcontrollers.
- **Communication Systems:** Providing stable power to communication equipment.

6. Safety Measures:

- DC power supplies often incorporate safety features such as overcurrent protection and overvoltage protection to prevent damage to connected devices.

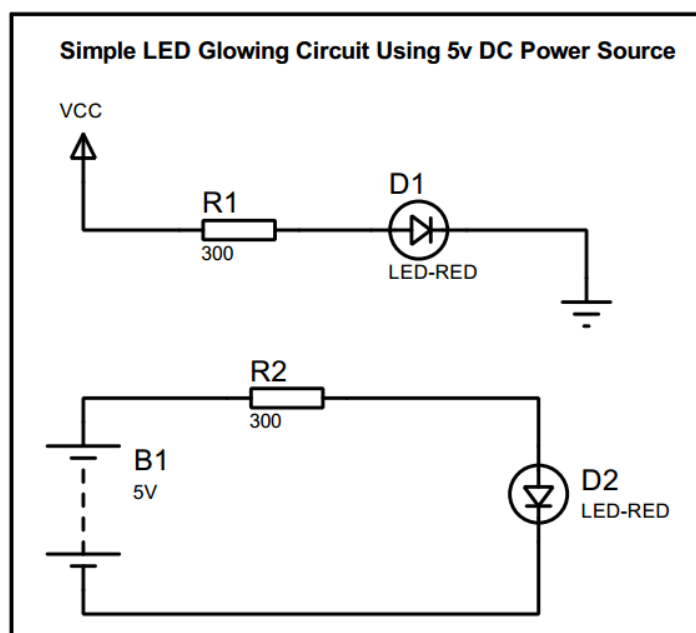
Lab Task 01

Comply the task in group and, **Try** to simulate the given circuit in proteus and also implement on hardware using bread board.

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Rubric:

Marks	1	2	3	4
Simulations	The simulation is not as per guidelines and requirements are not met	Some section of code simulation is correct	Most section of simulation is correct and understands it well	The simulation is properly done, and have good understanding about it
Team Work	Rarely listens to, shares with, and supports the efforts of others. Often is not a good team member.	Often listen to, shares with and supports the efforts of others, but sometimes is not good team member.	Usually listen to, shares with, and supports the efforts of others. Usually, respectful and listening actively	Almost always listens to, shares with and supports the efforts of others. Tries to keep people working well together.



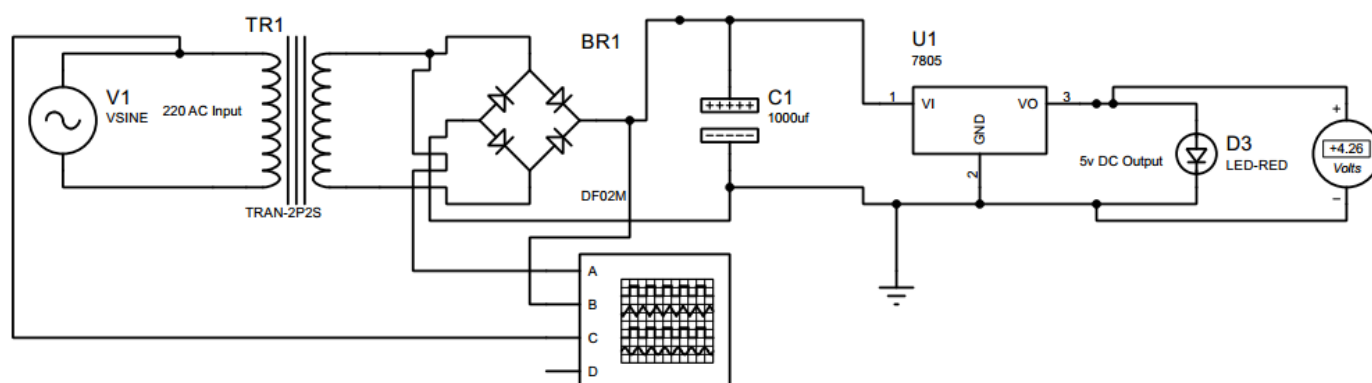
Lab Task 02

Comply the task in group and, **Try** to simulate the given circuit in proteus and also implement on hardware using bread board.

[CLO-02 & 03, PLO-05 & 09, P3(Guided Response) & A2(Responding), Rubric (Simulation & Team Work)]

Rubric:

Marks	1	2	3	4
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Hardware Components Required:

- 12v 1 Amp Transformer (1)
- W10 Bridge Rectifier (1)
- 1000 uF 25v Capacitor (1)
- 7805 Voltage Regulator (1)
- Wire (1 meter)
- Plug (2 pin)

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Lab Report Rubric: *must be submitted in next lab.*

Marks	1	2	3	4
Lab Report	The lab report does not follow the guidelines for formatting.	Presents some sections of the lab in the correct order. Three or more sections are not in the correct order; missing heading or title;	Presents most sections of the lab in the correct order, one or two sections may not be in the correct order; heading or title missing or not complete;	Presents all the sections of the lab in the correct order with correct formatting: includes correct heading, section headings and title of lab;