http://www.iqytechnicalcollege.com/Passwordprotect/VituralLabMod.htm

UEECD0044+UEECD0046+UEEEL0020

AC DC Circuit Lab

Watt meter Volt meter Ammeter

https://dcaclab.com/gl/experiments/71514-wattmeter-1

UEEEL0020

Virtual Oscilloscope

https://academo.org/demos/virtual-oscilloscope/

Virtual Three Phase Power Measurement

https://asnm-iitkgp.vlabs.ac.in/exp/three-phase-power-measurement/simulation.html

https://dcaclab.com/el/experiments/60823-star-delta-6

Power meter

https://elms-iitr.vlabs.ac.in/exp/three-phase-power/simulation.html

Power meter Lab Instruction

www.iqytechnicalcollege.com/Passwordprotect/Instruction.jpg

Electrical Machines (Simulation)

https://ems-iitr.vlabs.ac.in/List%20of%20experiments.html

1. Familiarization of the electrical machine laboratory apparatus
2. To study the Load Characteristics of DC shunt generator
3. Speed Control of DC motor by field resistance control
4. Speed Control of DC motor by armature resistance control
5. To perform speed control of DC motor by using Ward- Leonard Method of speed control

6. Determination of Transformer equivalent circuit from Open Circuit and Short Circuit Test
7. To study Magnetisation Characteristics of DC shunt generator
8. Speed control of slipring Induction Motor

VIRTUAL MACHINE LAB WORKBOOK

www.iqytechnicalcollege.com/Passwordprotect/VirtualLabMachineLabWorkbook.pdf

UEECD0046

1/Familiarization of the electrical machine laboratory apparatus

https://ems-iitr.vlabs.ac.in/exp/lab-equipment-familiarization/

Electrochemical

https://www.mrpalermo.com/virtual-lab-electrochemical-cells.html#google_vignette

https://media.pearsoncmg.com/bc/bc_0media_chem/chem_sim/html5/Electro/Electro.php

UEEEL0019

2/To study the Load Characteristics of DC shunt generator

https://ems-iitr.vlabs.ac.in/exp/load-characteristics-dc-shunt/

To study the Load Characteristics of DC shunt generator

STEP 1: Make Connections as per the instructions given below:

From	R	R	B	B	A2	L	F	A	L2	A4	Z4	I	J	H	H
To	C	E	G	A2	Z2	D	Z1	A1	A4	Z4	K	J	L1	A3	Z3

STEP 2: Click on **"Check"** Button for checking the connections.

STEP 3: If connections is correct, MCB will be turned ON.

STEP 4: Select the No. of Bulbs from the Lamp load.

STEP 5: Click on **"Add"** Button to add the values to the Observation Table.

STEP 6: Add different values to the Table by increasing the lamp load.

STEP 7: Click on **"Graph"** Button to Create Graph.

STEP 8: Click on **"Print"** Button to print the webpage.

STEP 9: Click on **"Reset"** Button to reset the webpage.

3/Speed Control of DC motor by field resistance control

To study the speed control of DC Motor by field resistance Control. Draw the graph between the armature current and motor speed by varying the field resistance.

https://ems-iitr.vlabs.ac.in/exp/dcmotor-field-resistance-control/

STEP 1: Make connections as per the instructions given below:

From	A	B	B	B	Q	G	E	F	H	I	C
To	P	K	Y	J	L	R	M	D	I	C	H

STEP 2: Then Check the connections by clicking on **"Check"** Button.

STEP 3: If it shows alert **"Incorrect Corrections"** then click on node number to detach the wire or press reset button and make connection again.

STEP 4: If it shows alert **"Correct Connections"** then Turn On the MCB.

STEP 5: Then set the Voltmeter first with the help of the second slider.

STEP 6: Now, move the first slider to get corresponding values of Ammeter and Speedometer.

STEP 7: Press the **"Add to table"** button to insert the values in the table.

STEP 8: After inserting values on table click on **"Plot graph"** to get your required

graph.

STEP 9: Click on **"Print"** button to print the webpage.

STEP 10: Click on **"Reset"** button to reset the webpage.

4/Speed Control of DC motor by armature resistance control

To study the speed control of D.C. Shunt motor by armature control method. Draw the graph between armature voltage and motor speed by varring the armature voltage.

https://ems-iitr.vlabs.ac.in/exp/dcshunt-motor-armature-control/

STEP 1: Make connections as per the instructions given below:

From	R	B	B	B	F	A	G	I	C	A1	K
To	L	D	A2	F2	E	J	H	F1	A1	K	C

NOTE: If wire is wrongly connected, Click on node number to detach the wire.

STEP 2: Click on Check button for checking the connections.

STEP 3: Click on MCB to turn on the supply.

STEP 4: Now, move the second slider to get corresponding values of Voltmeter and Speedometer.

STEP 5: Click on Add to Table button to add values to the observation table.

STEP 6: Repeat steps 4 to 5 to add more values in table.

STEP 7: Click on Graph button to make a respective graph regarding the values in table.

STEP 8: Click on Print button to print the webpage.

STEP 9: Click on Reset button to reset the webpage.

5/To perform speed control of DC motor by using Ward- Leonard Method of speed control

To perform speed control of DC motor by using Ward-Leonard Method. Draw the graph between armature voltage and speed of motor.

https://ems-iitr.vlabs.ac.in/exp/dcmotor-ward-leonard/

STEP 1: Make connections as per the instructions given below:

From	A1	B1	C1	E1	F1	G1	D1	K1	K1	K1	H1	H1	J1	J1	I2	M1	N2	L1	L2
To	A2	B2	C2	E2	F2	G2	D2	M1	K2	L1	H2	I1	J2	I2	M2	N1	O1	L2	M1

STEP 2: Click on **"Check Connection"** button to check the connections.

STEP 3: If the connections are not correct, you can click on node number to detach the wire or click on **"Reset"** button to make all the connections again.

STEP 4: If the connections are correct, then Turn "ON" the MCB Switch.

STEP 5: Then, Click on the Auto Transformer knob.

STEP 6: Now, Slide the Knob of the Rheostat. The readings of Voltmeter and RPM will be shown in the display.

STEP 7: Click on **"Add to table"** button to add the readings to the observation table and Live Graph will be created when readings are added in the table.

STEP 8: Click on **"Print"** button to print the webpage.

7/To study Magnetisation Characteristics of DC shunt generator

To study the magnetisation characteristics of DC Shunt Generator. Draw the graph between the armature voltage and field current.

https://ems-iitr.vlabs.ac.in/exp/magnetization-characteristics-dcshunt/

STEP 1: Make connections as per the instructions given below:

From	R	B	B	B	F	A	H	C	D	E	G
To	L	H	A2	F2	I	A1	F1	A3	A4	F3	F4

NOTE: If wire is wrongly connected, Click on node number to detach the wire.

STEP 2: Click on Check button for checking the connections.

STEP 3: Click on MCB to turn on the supply.

STEP 4: Now, move the slider on the rheostat to take observations from Voltmeter and Ammeter.

STEP 5: Click on Add to Table button to add values to the observation table.

STEP 6: Repeat steps 4 to 5 to add more values in the table.

STEP 7: Click on Graph button to make a respective graph regarding the values in the table.

STEP 8: Click on Print button to print the webpage.

STEP 9: Click on Reset button to reset the webpage.

UEEEL0025

6/Determination of Transformer equivalent circuit from Open Circuit and Short Circuit Test

Determination of Transformer equivalent circuit from Open Circuit and Short Circuit Test.

https://ems-iitr.vlabs.ac.in/exp/circuit-parameters-oc-test/

STEP 1: Make the proper connection by clicking the node as instructed below. If the wire is wrongly connected, Click on the node number to detach the wire.

From	A	B	D	E	E	D	H	C	L	V	S1	S2
To	D	E	F	G	I	P2	M	L	P1	P2	K	J

STEP 2: Click on **"Check Connection"** button for checking the connections.

- If connection is correct, an alert appears. Click ok.

Now, go to step 4.

- If connection is wrong, an alert appears. Click ok.

Now, go to step 3.

STEP 3: Check the connection and either detach the incorrect wire connection or Click on **"Reset"** button and start from step 1.

STEP 4: Switch on the MCB.

STEP 5: Click on the Autotransformer knob.

STEP 6: Click on **"Add to Table"** button to add the readings to the observation table.

STEP 7: Click on **"Short Circuit Test"** button to perform the SC Test.

STEP 8: Make the proper connection by clicking the node as instructed below. If the wire is wrongly connected, Click on the node number to detach the wire.

From	A	B	D	E	E	D	H	C	L	V	S1
To	D	E	F	G	I	P2	M	L	P1	P2	S2

STEP 9: Repeat steps 2 to 6.

STEP 10: Click on **"Submit"** button to get an equivalent circuit diagram of transformer.

STEP 11: Click on **"Print"** button to print the webpage.

UEEEL0024+UEEEL0005

8/Speed control of slipring Induction Motor

To perform the speed control test on slip ring induction motor by rotor resistance control method. Plot the motor speed characteristics at different values of applied resistance in slip ring of induction motor.

https://ems-iitr.vlabs.ac.in/exp/speed-control-slip-ring/

Speed control of slipring Induction Motor.

STEP 1: Make connections as per the instructions given below. If the wire is wrongly connected, Click on node number to detach the wire.

From	1	2	3	4	5	6	7	9	10	11	16	17	18	19	20
To	21	22	23	12	13	12	8	15	12	17	13	14	24	25	26

STEP 2: Click on **"Check"** button for checking the connections.

- If connection is correct, an alert appears. Click ok. Now, go to step 4.
- If connection is wrong, an alert appears. Click ok. Now, go to step 3.

STEP 3: Check the connection and either detach the incorrect wire connection or Click on Reset button and start from step 1.

STEP 4: Switch on the MCB.

STEP 5: Click on the autotransformer knob.

STEP 6: Slide the knob of the Rheostat to change the resistance.

STEP 7: Click on **"Add to table"** button to insert the readings in the table.

STEP 8: Follow the procedure from step 6 to step 7, till you have the 6 readings in the table.

STEP 9: After taking minimum 6 readings, Click on the **"Graph"** button.

STEP 10: Click on **"Print"** button to print the full connections with graph and table.

UEEEL0021 Electromagnetism

Faraday Law

https://phet.colorado.edu/en/simulations/faradays-electromagnetic-lab

Faraday Electromagnetic Lab

https://phet.colorado.edu/en/simulations/faradays-electromagnetic-lab

Generator

https://phet.colorado.edu/en/simulations/generator

Magnetic and compass

https://phet.colorado.edu/en/simulations/magnet-and-compass

UEEEL0008 Heating

Energy Skate

https://phet.colorado.edu/en/simulations/energy-skate-park

Energy Form and Change

https://phet.colorado.edu/en/simulations/energy-forms-and-changes

State of matters

https://phet.colorado.edu/en/simulations/states-of-matter

Heating simulator

https://heatpumps.co.uk/heating/simulator.html