



**Department of Electrical and Electronics Engineering**  
**Academic Year: 2022-2023 (Even Semester)**

**Degree, Semester & Branch: II Semester B.E. Mechanical**  
**Course Code & Title: BE3251 - Basic Electrical and Electronics Engineering**  
**Name of the Faculty member: Dr.B.Deepa Lakshmi**

### Innovative Practice Description

- **Unit / Topic:** Unit I / Mesh Analysis with Independent Sources
- **Course Outcome:** CO 1
- **Unit Outcome:** TLO2
- **Activity Chosen:** Collaborative Study

- **Justification:**

Collaborative learning is used to learn about any topic within a group. When compared to self learning, students are engaged in groups to discuss and learn among them. Here discussion between small groups happen and learning occurs within the group. It enhances the learning among the students through effective discussions and debate.

**Time Allotted for the Activity:** 25 minutes

- **Details of the Implementation:**

The students were asked to split into groups and discuss about mesh analysis. Problem has been given to the groups to discuss, solve and obtain the answers. The time allotted is 25 minutes.

**CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	-	-	-	-	-	-	1	-	1	-	-	-

(1 – Low 2 – Moderate 3 – High)

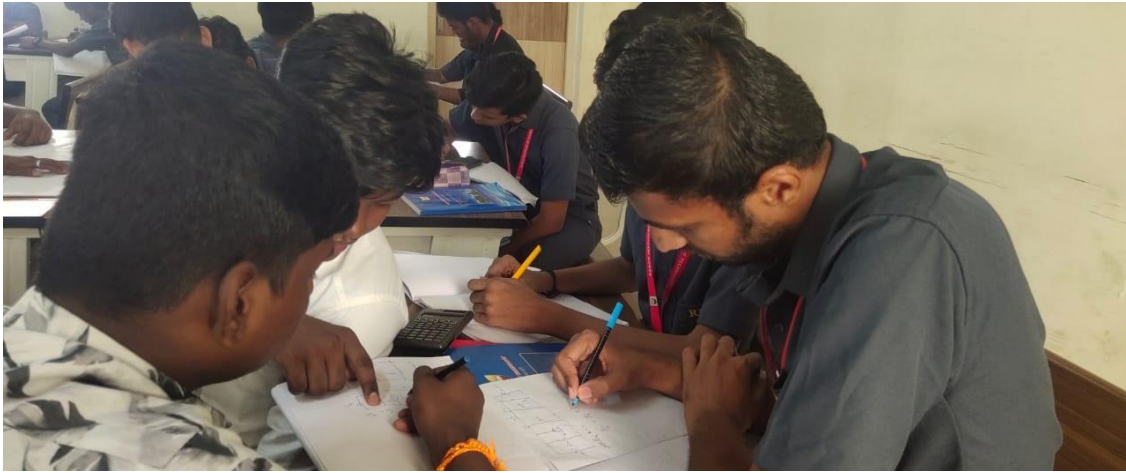
- **PO / PSO mapped:**

<b>Innovative practice</b>	<b>PO9</b>
	1
<b>Justification for correlation</b>	The students can effectively discuss as a team and solve the problem given

- **Images / Screenshot of the practice:**

## Innovative Teaching Method Execution

### Mesh Analysis with Independent Sources – Collaborative Study



- **Reflective Critique:**

- ❖ **Feedback of practice from students and other stakeholders:**

- ✓ More questions were asked to the students and came to know that they understood the concept well and able to solve the given problem under mesh analysis.
- ✓ They could be able to analyse the problem and obtain the answers.

- ❖ **Benefit of the practice:**

This collaborative study enhances the students for better learning through healthy discussion.

- ❖ **Challenges faced in implementation:**

I planned the activity for 25 minutes. But it takes 40 minutes to implement.

**References:**

1. David A. Bell , ”Electronic devices and circuits”, Oxford University higher education, 5<sup>th</sup> edition 2008.
2. S.K. Bhattacharya “Basic Electrical and Electronics Engineering”, Pearson Education, Second Edition, 2017.

**Signature of Faculty Member**

**HOD**



## Department of Electrical and Electronics Engineering

Academic Year 2022 – 2023 (Even Semester)

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Name of the Faculty member (s): Dr.B.Deepa Lakshmi

### Innovative Practice Description

- **Unit / Topic:** Unit II / Construction and Working principle- DC Separately and Self excited Generators
- **Course Outcome:** CO 2
- **Unit Outcome:** TLO4
- **Activity Chosen:** Demonstration
- **Justification:**

After teaching the concept – Construction of DC Machine, I thought of showing the DC machine and demonstrate the types of DC generator so that the students can understand the construction clearly.

- **Time Allotted for the Activity:** 15 minutes

#### • Details of the Implementation:

At the end the Class (Last 15 minutes)

- ✓ I asked the students to think about various parts of the DC machine for 2 minutes.
- ✓ Then I told them to Pair with their neighbours and discuss about the construction of the machine for another 1 minute.
- ✓ Finally, the parts of the machine was shown and explained to the students.

#### • CO – PO / PSO mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-

(1 – Low      2 – Moderate      3 – High)

#### • PO / PSO mapped:

<b>Innovative practice</b>	<b>PO 9</b>
	<b>1</b>
<b>Justification for correlation</b>	The students can function effectively as a team and discuss about the construction of DC machine

- **Images / Screenshot of the practice:**



**Reflective Critique:**

- ❖ ***Feedback of practice from students and other stakeholders:***

Students replied that visually seeing the parts provide better understanding of the topic and able to recollect anytime.

- ❖ ***Benefit of the practice:***

1. Students can able to understand the impact of engineering solution on society
2. Students can able to explain the concepts in examination without any confusion.

- ❖ ***Challenges faced in implementation:***

1. Time utilization for conducting activity.

**References:**

1. Kothari DP and I.J Nagrath, “Basic Electrical and Electronics Engineering”, Second Edition, McGraw Hill Education, 2020
2. S.K. Bhattacharya “Basic Electrical and Electronics Engineering”, Pearson Education, Second Edition, 2017.

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## Department of Electrical and Electronics Engineering Academic Year 2022 – 2023 (Even Semester)

**Degree, Semester & Branch: II Semester B.E. Mechanical**

**Course Code & Title: BE3251 - Basic Electrical and Electronics Engineering**

**Name of the Faculty member : Dr.B.Deepa Lakshmi**

### Innovative Practice Description

- **Unit / Topic:** Unit III / Operation of Zener Diode
- **Course Outcome:** CO 3
- **Unit Outcome:** TLO7
- **Activity Chosen:** Virtual Lab
- **Justification:**

Virtual lab enables a virtual teaching and learning environment which develops students' practical knowledge. It is one of the most important eLearning tools that allows the student to perform various experiments without any constraints to place or time. Through this VLAB, the student can understand the characteristics of BJT under CE configuration.

**Time Allotted for the Activity:** 15 minutes

#### • **Details of the Implementation:**

The students were asked to do the following steps

1. Set DC voltage to 10V
2. Set the Series Resistance ( $R_S$ ) to 505  $\Omega$
3. Set Zener voltage ( $V_Z$ ) to 5V.
4. Vary the Load Resistance ( $R_L$ ).
5. Voltmeter to be placed parallel to load resistor and ammeter in series with the series resistor.
6. Choose Load Resistance so that Zener diode is 'on' mode.
7. Note the Voltmeter and Ammeter readings for different values of Load Resistance.
8. Note the Load current( $I_L$ ), zener current( $I_Z$ ), Output voltage( $V_O$ )
9. Calculate the voltage regulation.

#### **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO3	2	1	1	-	2	-	-	-	-	1	-	1	-	-	-

(1 – Low 2 – Moderate 3 – High)



- **PO / PSO mapped:**

<b>Innovative practice</b>	<b>PO5</b>
	1
<b>Justification for correlation</b>	The students can effectively use the virtual lab and acquire knowledge about the characteristics.

- **Images / Screenshot of the practice:**

### Innovative Teaching Method Execution

#### Operation of Zener Diode – Virtual Lab

#### Zener Diode - LOAD Regulator

**INSTRUCTION**

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**EXPERIMENTAL TABLE**

DC Voltage ( $V_{DC}$ ):  V Zener Voltage ( $V_Z$ ):  V

Series Resistance ( $R_S$ ):  K $\Omega$

Serial No.	Load Resistance ( $R_L$ ) Ohm	Load Current ( $I_L$ ) mA	Zener Current ( $I_Z$ ) mA	Regulated Output Voltage ( $V_O$ ) V	% Voltage Regulation
1	495	10.1	0	10	50.5
2	640	7.81	2.09	5.00	44.1
3	709	7.05	2.85	5.00	41.6
4	808	6.19	3.71	5.00	38.5
5	915	5.46	4.44	5.00	35.6

**CONTROLS**

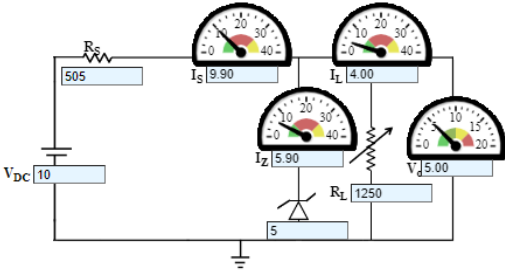
DC volt :  Volt

Zener Diode ( $V_Z$ ) :  Volt

Resistance ( $R_S$ ) :  Ohms

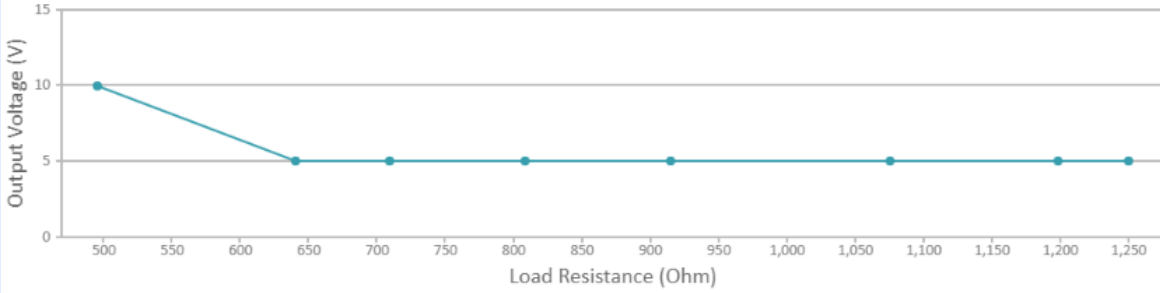
Resistance ( $R_L$ ) :  Ohms

Print It  
Take another sets of Output Voltage for another Zener value



**GRAPH PLOT**

#### RI-Vo Plot



Load Resistance (Ohm)	Output Voltage (V)
500	10.0
650	5.0
709	5.0
808	5.0
915	5.0
1250	5.0

- **Reflective Critique:**

❖ ***Feedback of practice from students and other stakeholders:***

- ✓ More questions were asked to the students and came to know that they understood the concept well and the usage of virtual lab.
- ✓ They could be able to plot V-I characteristics of zener diode.

❖ ***Benefit of the practice:***

Beyond knowing the theoretical concepts, it is important to implement the concepts practically. So, knowing simulation is also needed to improve the technical knowledge of the students. Students can correlate the concepts studied theoretically with the experiments they simulated

❖ ***Challenges faced in implementation:***

I planned the activity for 15 minutes. But it takes 30 minutes to implement.

References:

1. David A. Bell , ”Electronic devices and circuits”, Oxford University higher education, 5<sup>th</sup> edition 2008.
2. S.K. Bhattacharya “Basic Electrical and Electronics Engineering”, Pearson Education, Second Edition, 2017.

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**Name of the Faculty member (s): Dr.B.Deepa Lakshmi**

### Innovative Practice Description

- **Unit / Topic: Unit IV / K-map representations, Minimization using K-map**
- **Course Outcome: CO 4**
- **Unit Outcome: TLO13**
- **Activity Chosen: Think pair share**
- **Justification:**
  - ✓ Implementing this activity helps the students to think about any topic.
  - ✓ It enables the students to share ideas with classmates and enhance their oral communication skills.

- **Time Allotted for the Activity: 15 minutes**

- **Details of the Implementation:**

Think-Pair-Share is an innovative practice conducted after explaining the K-map concepts to the students. First, I instruct the students to think about K-map minimization for 2 minutes. Then I grouped them in to pairs to discuss their approach among them to minimize k-map for 3 minutes. Finally, I asked each pair to share their answers with the entire class for 10 minutes.

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO4	3	-	-	-	-	-	-	-	-	1	-	1	-	-	-

(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

<b>Innovative practice</b>	<b>PO9</b>
	1
<b>Justification for correlation</b>	The students can function effectively as a team and learn the concepts

- **Images / Screenshot of the practice:**



- **Reflective Critique:**

- ❖ **Feedback of practice from students and other stakeholders:**

- ✓ Students understood the concept well and able to solve any given problem and reduce using K-map.
- ✓ I have asked questions from the students and came to know that they could analyse and minimize k-map easily

- ❖ **Benefit of the practice:**

Think-pair-share activity makes all the students to involve and discuss about the topic. This enhances them to improve their idea representation and team work.

- ❖ **Challenges faced in implementation:**

I planned the activity for 10 minutes. But in Class room it takes 20 minutes.

References:

1. Kothari DP and I.J Nagrath, “Basic Electrical and Electronics Engineering”, Second Edition, McGraw Hill Education, 2020
2. S.K. Bhattacharya “Basic Electrical and Electronics Engineering”, Pearson Education, Second Edition, 2017.

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