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

Degree, Semester & Branch: II Semester B.E. CSE 'A'
Course Code & Title: BE3251 - Basic Electrical and Electronics Engineering
Name of the Faculty member (s): Mr. A. Arun Kumar

Innovative Practice Description

- **Unit / Topic: Unit I / Mesh analysis with Independent sources only (Steady state)**
- **Course Outcome:** CO 1
- **Unit Outcome:** TLO2
- **Activity Chosen:** Think pair share
- **Justification:**
  - ✓ It helps students to think individually about a topic or answer to a question.
  - ✓ It teaches students to share ideas with classmates and builds oral communication skills.
  - ✓ It helps focus attention and engage students in comprehending the reading material.
- **Time Allotted for the Activity:** 10 minutes
- **Details of the Implementation:**

  Think-Pair-Share innovative practice conducted for II year CSE students, after explained the concept of Mesh analysis with Independent sources only (Steady state). First, I asked the students to think about how you would apply mesh analysis to analyze the circuit and calculate the mesh currents for 2 minutes. Then I make them as a pair to discuss your approach to solving the circuit using mesh analysis. Share your thoughts, strategies, and the equations you have written for the mesh currents for 3 minutes. Finally, I asked each pair should share their findings with the entire class. One person from each pair will present their approach, the mesh equations, and how they tackled the circuit analysis challenges for 10 minutes.

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	1	-	1	-	1	-

(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

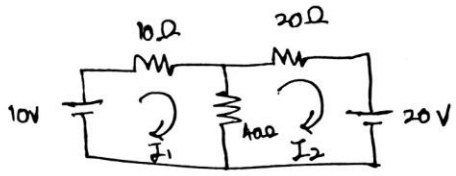
Innovative practice	**PO9**
	1
Justification for correlation	The students can Function effectively as a team

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

Innovative Teaching Method Execution
Mesh analysis with Independent sources – Think Pair Share

Malini S - 953622104054

Kiruthiga P - 953622104051



$10I_1 + 40(I_1 - I_2) = 10$

$50I_1 - 40I_2 = 10$ ——— (1)

$20I_2 + 40(I_2 - I_1) = 20$

$-40I_1 + 60I_2 = -20$ ——→ (2)

$$\begin{bmatrix} 50 & -40 \\ -40 & 60 \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} 10 \\ -20 \end{bmatrix}$$

$$\begin{bmatrix} 50 & -40 \\ -40 & 60 \end{bmatrix} = 3000 - 1600 = 1400$$

$$\Delta I_1 = \begin{bmatrix} 10 & -40 \\ -20 & 60 \end{bmatrix} = 600 - 800 = -200$$

$$\Delta I_2 = \begin{bmatrix} 50 & 10 \\ -40 & -20 \end{bmatrix} = -1000 + 400 = -600$$

$$I_1 = \frac{\Delta I_1}{\Delta} = \frac{-200}{1400} = -0.143\ A$$

$$I_2 = \frac{\Delta I_2}{\Delta} = \frac{-600}{1400} = -0.429\ A$$

$I_1 = -0.143\ A$

$I_2 = -0.429\ A$

- **Reflective Critique:**
  - ***Feedback of practice from students and other stakeholders:***
    - ✓ Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
  - ***Benefit of the practice:***

    Think-pair-sharing forces all students to attempt an initial response to the question, which they can then clarify and expand as they collaborate. It also gives them a chance to validate their ideas in a small group before mentioning them to the large group, which may help shy students feel more confident participating.
  - ***Challenges faced in implementation:***

    I planned the activity for 10 minutes. But in Class room it takes 15 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.
3. Sedha R.S., "A textbook book of Applied Electronics", S. Chand & Co., 2008
4. James A .Svoboda, Richard C. Dorf, "Dorf's Introduction to Electric Circuits", Wiley, 2018.
5. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015.

Signature of Faculty Member **HOD**

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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:**

The construction detail of the DC Generator is taught using the active learning approach of demonstration, Students' involvement in the learning is improved based on this demonstration approach.

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

- **Details of the Implementation:**

After teaching the concept, give students one or two minutes to think about the topic without writing anything.
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 neighbors and discuss about the construction of the machine for another 1 minute.
- ✓ Finally, I shown the motor parts for each student and explained.

- **CO – PO / PSO mapping:**

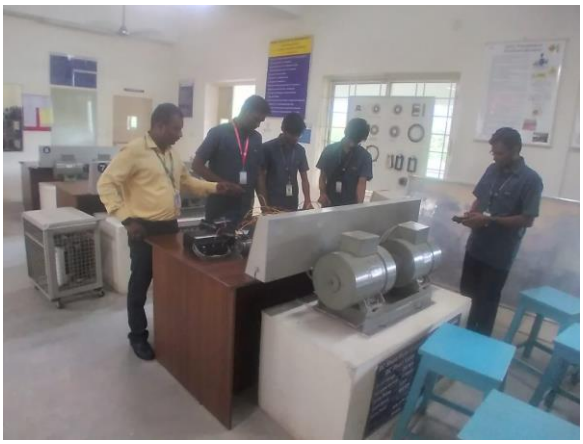
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO2	2	1	-	-	-	-	-	-	-	1	-	1	-	1	-

(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

Innovative practice	**PO 9**
	1
Justification for correlation	The students can Function effectively as a team

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




Reflective Critique:

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

Students told that it is good see all the parts of the machines individually and demonstration helps the students to understand the concepts easily.

❖ ***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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Innovative Practice Description

- **Unit / Topic:** Unit III / Operation of Zener Diode
- **Course Outcome:** CO 2
- **Unit Outcome:** TLO7
- **Activity Chosen:** Virtual Lab
- **Justification:**

Virtual lab refers to a virtual teaching and learning environment aimed at developing students' laboratory skills. As one of the most important eLearning tools, they allow the student to conduct various experiments without any constraints to place or time, in contrast to the constraints of real labs. By this 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 10 volt.
2. Set the Series Resistance (R_S) to 505 Ω
3. Set Zener voltage (V_Z) to 5.0 V.
4. Vary the Load Resistance (R_L).
5. Voltmeter is placed parallel to load resistor and ammeter series with the series resistor.
6. Choose Load Resistance in such a manner, such that the Zener diode is 'on'.
7. Now note the Voltmeter and Ammeter reading for various Load Resistance.
8. Increase the load resistance (R_L).
9. Note the Load current(I_L), zener current(I_Z), Output voltage(V_O)
10. 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	-	1	-	1	-

(1 – Low 2 – Moderate 3 – High)

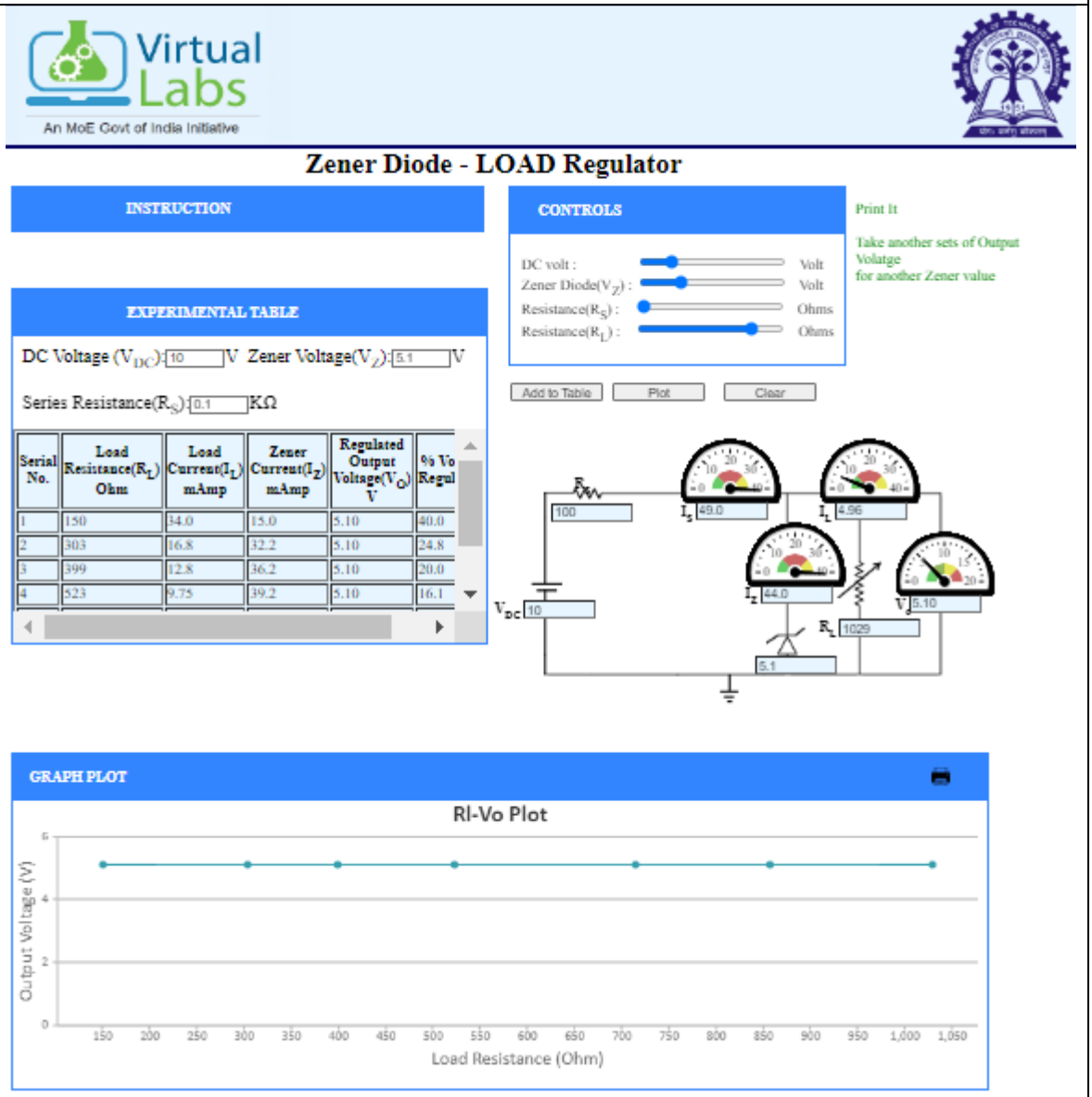
- **PO / PSO mapped:**

Innovative practice	**PO5**
	1
Justification for correlation	The students can effectively use the virtual lab.

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

Innovative Teaching Method Execution

Operation of Zener Diode – Virtual Lab



- **Reflective Critique:**
  - ❖ ***Feedback of practice from students and other stakeholders:***
    - ✓ Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
    - ✓ Also they can able to visualise the IV characteristics of zener diode, therefore they easily understand the concept.

  - ❖ ***Benefit of the practice:***

The process of simulating a scenario to practice different responses and actions to a real life situation is extremely effective in knowledge retention. This is because knowledge isn't in theory – the user needs to apply it in a real-life

situation. Simulations can be slowed down to study behavior more closely. Conditions can be varied and outcomes investigated. Also Critical situations can be investigated without risk.

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

  I planned the activity for 15 minutes. But in Class room it takes 25 minutes.

References:

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

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Innovative Practice Description

- **Unit / Topic: Unit IV /** Conversion of number systems
- **Course Outcome:** CO 4
- **Topic Learning Outcome:** TLO11
- **Activity Chosen:** Concept Map
- **Justification:**

Concept mapping is a creative way to set goals, solve problems and design action plans. It quickly records ideas in a free-form way. When groups use concept mapping, the thoughts of each participant easily trigger ideas in others. This dynamic group interaction encourages breaking free of old patterns to uncover new and innovative approaches. For this topic, there are different types of Conversion of number systems can be brought in to single map for better understanding.

- **Time Allotted for the Activity:** 10 minutes
- **Details of the Implementation:**

  Concept mapping activities require students to actively engage in their learning, often by connecting their prior knowledge to new information. When creating a mini map, a student frequently interacts with a textbook, notes from class, an instructor, classmate, or study group.

  In my subject Concept map was conducted for the topic Conversion of number systems. The students are voluntarily drawn the map.

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO4	2	1	-	-	-	-	-	-	-	1	-	1	-	1	-

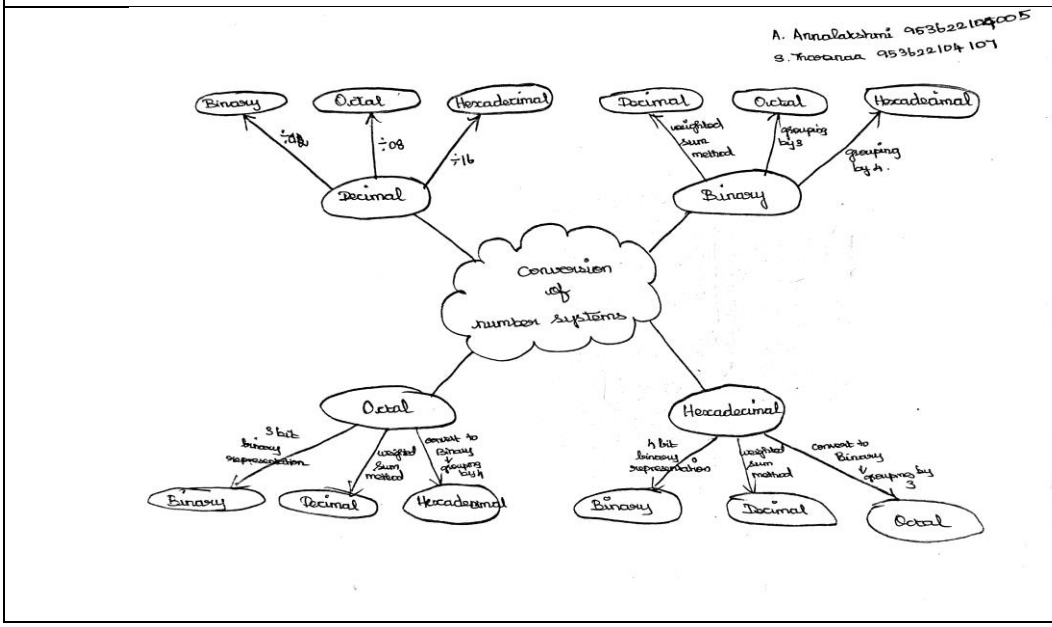
(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

Innovative practice	**PO9**
	1
Justification for correlation	The students can Function effectively as a team

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

Innovative Teaching Method Execution
Conversion of number systems - Concept map



- **Reflective Critique:**
  - ***Feedback of practice from students and other stakeholders:***

    Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
  - ***Benefit of the practice:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

    The benefits of concept maps are a great way for students to make notes on all of the information they receive. It helps the students to note down only the most important information using key words, and then make connections between facts and ideas visually – keeping all of your topic thoughts together on one sheet. It made key note making easier to students, as it reduces pages of notes into one single side of paper. Also mini map made slow learners to remember the information more quickly.

Challenges faced in implementation:

Normally teachers will give longer explanations in the notes section of the topic. The students are made into groups and to draw the map to Indicate relationships between the topics in biomass conversion process. I planned the activity for 10 minutes only. But in real scenario it takes 15 minutes to complete this activity.

References:

1. Sedha R.S., "A textbook book of Applied Electronics", S. Chand & Co., 2008
2. James A .Svoboda, Richard C. Dorf, "Dorf's Introduction to Electric Circuits", Wiley, 2018.
3. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015.

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Innovative Practice Description

- **Unit / Topic: Unit V /** Instrument Transformers – Potential Transformer
- **Course Outcome:** CO 5
- **Unit Outcome:** TLO16
- **Activity Chosen:** One-minute paper
- **Justification:**

  One-minute paper activity provides a conceptual bridge between successive class periods. Improve the quality of class discussion by having students write briefly about a concept or issue before they begin discussing it.
- **Time Allotted for the Activity:** 5 minutes
- **Details of the Implementation:**

  At the end of the class, students were asked to write about the topic discussed in the class. The students expressed the understood content and the content which were not clear in that particular topic. This activity shows whether the students can able to understand the specific topic and their involvement the particular class.
- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO5	2	1	-	-	-	-	-	-	1	1	-	1	-	1	-

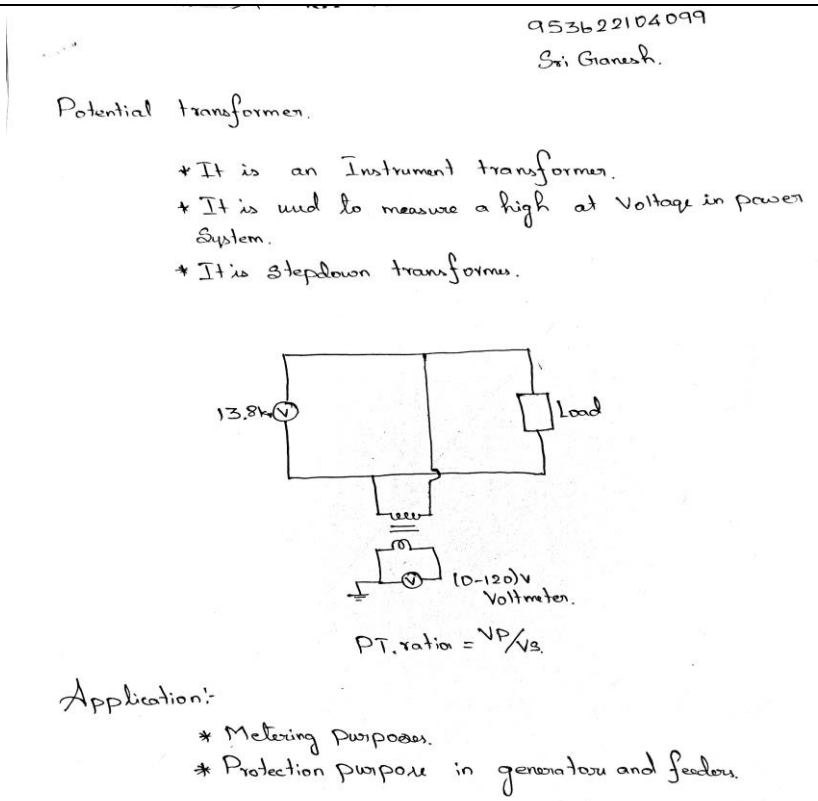
(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

Innovative practice	**PO9**
	1
Justification for correlation	The students can Function effectively as an individual

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

Innovative Teaching Method Execution
Instrument Transformers – Potential Transformer – One minute paper



- **Reflective Critique:**
  - ***Feedback of practice from students and other stakeholders:***
    - ✓ Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
  - ***Benefit of the practice:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)
    - ✓ Students can able to attend the question even in the questions are in indirect form.
    - ✓ Students can able to explain the concepts in examination without any confusion.
  - ***Challenges faced in implementation:***
    - ✓ Time utilization for conducting activity.

References:

1. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015.
2. Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill Education, 2020

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