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

Degree, Semester & Branch: II Semester B.Tech. CSBS
Course Code & Title: BE3251 - Basic Electrical and Electronics Engineering
Name of the Faculty member : S. Meenakshi Sundaravel

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 allow the student to perform various experiments without any constraints to place or time. Through this VLAB, the student can understand the operation, characteristics and application of zener diode as voltage regulator.

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 Ω
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)

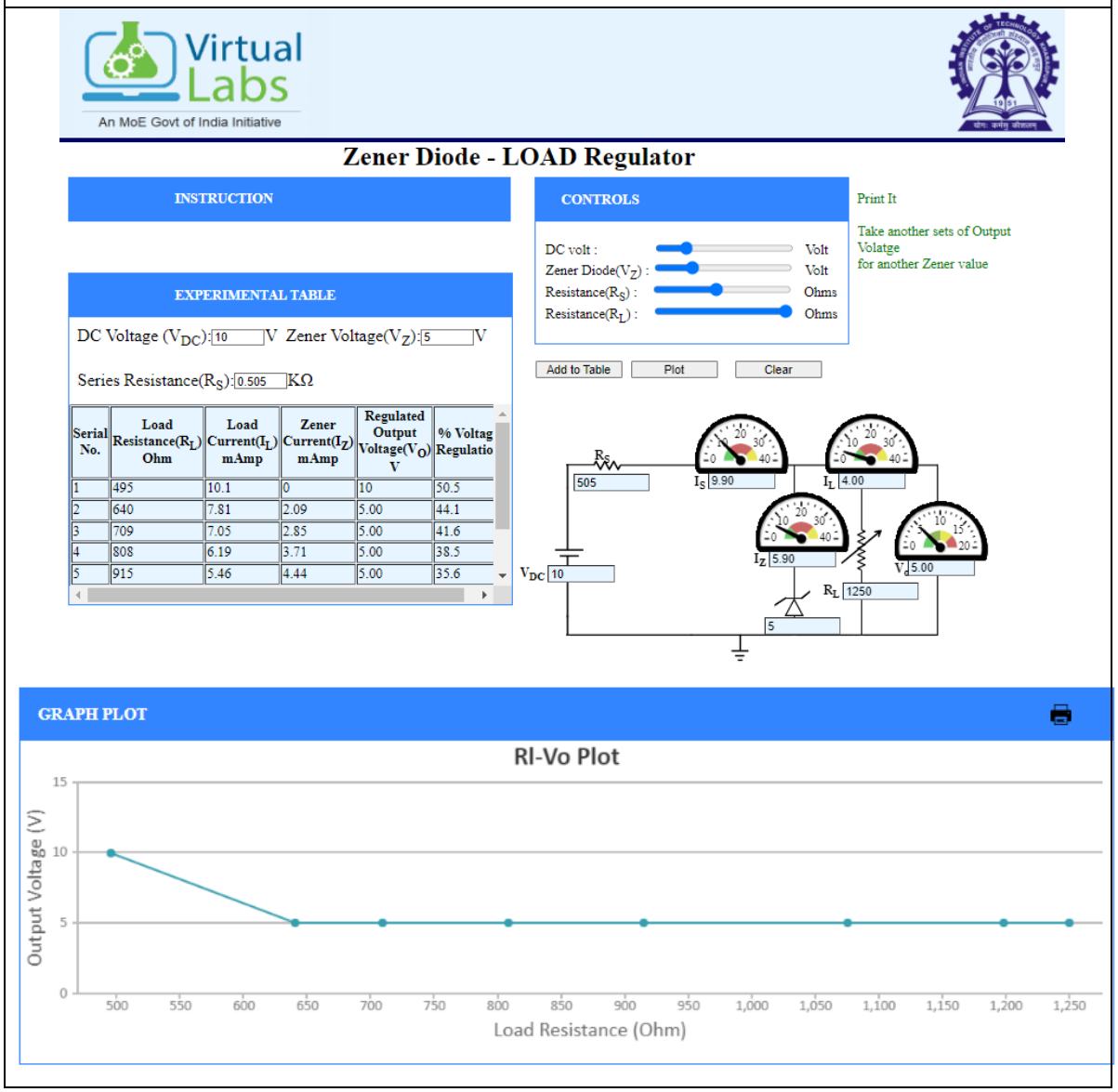
- **PO / PSO mapped:**

Innovative practice	PO5
	2
Justification for correlation	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



- **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, 5th edition 2008.
2. S.K. Bhattacharya "Basic Electrical and Electronics Engineering", Pearson Education, Second Edition, 2017.

Signature of Faculty Member **HOD**

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Innovative Practice Description

- **Unit / Topic:** Unit IV / Procedure for Minimization of Boolean functions using K-map
- **Course Outcome:** CO 4
- **Unit Outcome:** TLO13
- **Activity Chosen: Strip Sequence**
- **Justification:**
  - ✓ It helps students to arrange a set of objects, such as stages in a biological process or a sequence of historical events, in the correct order.
  - ✓ 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:**
- Strip Sequence innovative practice conducted for I year CSBS students, after explained the concept of Procedure for Minimization of Boolean functions using K-map**.** First, I asked the students to think about how you would arrange the list of items written on strips of paper to sort for 2 minutes. Then I make them to recall the steps for Minimization of Boolean functions using K-map and to share your thoughts, strategies, to arrange the strips for 3 minutes. Finally, I asked each pair should share their findings with the entire class. One person from each pair will present their sequence of strips approach and how they tackled to arrange the strips challenges for 10 minutes.

- **CO – PO / PSO mapping:**

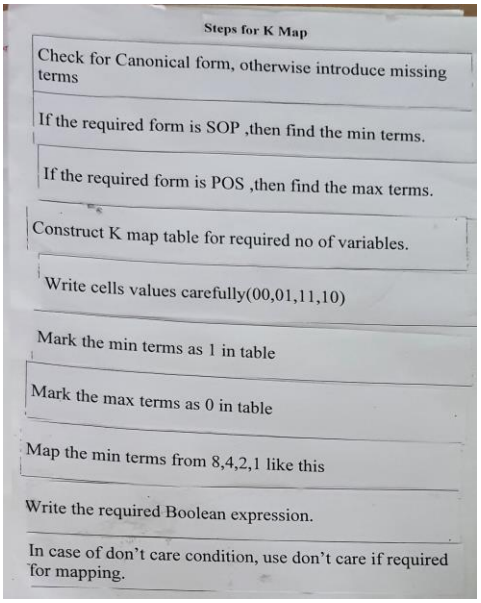
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	1	-	1	-	1	-

(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:**



Steps for K Map

Check for Canonical form, otherwise introduce missing terms
If the required form is SOP ,then find the min terms.
If the required form is POS ,then find the max terms.
Construct K map table for required no of variables.
Write cells values carefully(00,01,11,10)
Mark the min terms as 1 in table
Mark the max terms as 0 in table
Map the min terms from 8,4,2,1 like this
Write the required Boolean expression.
In case of don't care condition, use don't care if required for mapping.

- **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:***

    Strip Sequence activity 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 in participating.

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

    The Challenge for students is to work together to reconstruct a proper sequence, due to this, the activity takes 15 minutes. But it is planned for 10 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**