



# GOVERNMENT POLYTECHNIC KORAPUT

## Pr2. CIRCUIT AND SIMULATION LAB

|   |         |                           |      |
|---|---------|---------------------------|------|
| Name of the Course: Diploma in Electrical Engineering |         |                           |      |
| Faculty: Sandhya Kumari Randhi W.E.F:14.09.2022       |         |                           |      |
| Course code:  | PR2     | Semester                  | 3rd  |
| Total Period:   | 90      | Examination               | 3hrs |
| Theory periods:                                       | 6P/week | Sessional :               | 50   |
| Maximum marks:  | 100     | End Semester Examination: | 50   |

### DEPARTMENT OF ELECTRICAL

#### Vision:-

To create competent and industry ready Electrical diploma engineers with professional and social values to meet future challenges.

#### Mission:-

- To prepare diploma holders through “qualitative competency based education system” to compete with national requirement along with core values
- To produce dynamic Electrical Engineers to serve the society and industry .
- To develop leadership qualities, communication skills, critical thinking and attitude for Lifelong learning.

#### Program educational objectives:-

|       |   |
|-------|---|
| PEO1: | Apply technical knowledge and skills learned in the field of Electrical Engineering to excel in professional and/or higher education.                         |
| PEO2: | to provide students an excellent academic environment and make them aware the needs of Society and Industry to become a successful Professional/Entrepreneur. |
| PEO3: | To engage in lifelong learning, career enhancement to adopt emerging technologies   |

#### Course outcomes:-

|     |   |
|-----|---|
| Co1 | Verify the theorems using different components.               |
| Co2 | Know the various types of filters.                            |
| Co3 | Simulate different circuits using MATLAB software.            |
| Co4 | Analyze the charging and discharging of an R-C & R-L circuit. |

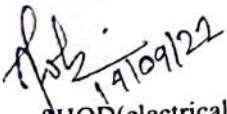
**GOVERNMENT POLYTECHNIC KORAPUT**

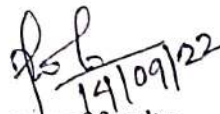
**LESSON PLAN**

| Week             | Class Day (3 periods per day) | Practical Topics  |
|------------------|-------------------------------|---|
| 1 <sup>st</sup>  | 1 <sup>st</sup>               | 1. Measurement of equivalent resistance in series and parallel circuit  |
|                  | 2 <sup>nd</sup>               | 1. Measurement of equivalent resistance in series and parallel circuit  |
| 2 <sup>nd</sup>  | 1 <sup>st</sup>               | 2. Measurement of power and power factor using series R-L-C Load.   |
|                  | 2 <sup>nd</sup>               | 2. Measurement of power and power factor using series R-L-C Load.   |
| 3 <sup>rd</sup>  | 1 <sup>st</sup>               | 3. Verification of KCL and KVL  |
|                  | 2 <sup>nd</sup>               | 3. Verification of KCL and KVL  |
| 4 <sup>th</sup>  | 1 <sup>st</sup>               | 4. Verification of Super position theorem   |
|                  | 2 <sup>nd</sup>               | 4. Verification of Super position theorem   |
| 5 <sup>th</sup>  | 1 <sup>st</sup>               | 5. Verification of Thevenin's Theorem   |
|                  | 2 <sup>nd</sup>               | 5. Verification of Thevenin's Theorem   |
| 6 <sup>th</sup>  | 1 <sup>st</sup>               | 6. Verification of Norton's Theorem   |
|                  | 2 <sup>nd</sup>               | 6. Verification of Norton's Theorem   |
| 7 <sup>th</sup>  | 1 <sup>st</sup>               | 7. Verification of Maximum power transfer Theorem   |
|                  | 2 <sup>nd</sup>               | 7. Verification of Maximum power transfer Theorem   |
| 8 <sup>th</sup>  | 1 <sup>st</sup>               | 8. Determine resonant frequency of series R-L-C circuit.  |
|                  | 2 <sup>nd</sup>               | 8. Determine resonant frequency of series R-L-C circuit.  |
| 9 <sup>th</sup>  | 1 <sup>st</sup>               | 9. Study of Low pass filter & determination of cut-off frequency  |
|                  | 2 <sup>nd</sup>               | 9. Study of Low pass filter & determination of cut-off frequency  |
| 10 <sup>th</sup> | 1 <sup>st</sup>               | 10. Study of High pass filter & determination of cut-off frequency  |
|                  | 2 <sup>nd</sup>               | 10. Study of High pass filter & determination of cut-off frequency  |
| 11 <sup>th</sup> | 1 <sup>st</sup>               | 11. Analyze the charging and discharging of an R-C & R-L circuit with oscilloscope and Compute the time constant from the tabulated data and determine the rise time graphically. |
|                  | 2 <sup>nd</sup>               | 11. Analyze the charging and discharging of an R-C & R-L circuit with oscilloscope and Compute the time constant from the tabulated data and determine                            |

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|                  |                 |  |
|------------------|-----------------|--|
|                  |                 | the rise time graphically.   |
|                  | 1 <sup>st</sup> | 12. Introduction to P-Spice/MATLAB software.   |
|                  | 2 <sup>nd</sup> | 12. Construct the following circuits using P-Spice/MATLAB software and compare the measurements and waveforms.<br>i. Superposition theorem                       |
| 13 <sup>th</sup> | 1 <sup>st</sup> | 12. Construct the following circuits using P-Spice/MATLAB software and compare the measurements and waveforms.<br>ii. Series Resonant Circuit                    |
|                  | 2 <sup>nd</sup> | 12. Construct the following circuits using P-Spice/MATLAB software and compare the measurements and waveforms.<br>ii. Series Resonant Circuit                    |
| 14 <sup>th</sup> | 1 <sup>st</sup> | 12. Construct the following circuits using P-Spice/MATLAB software and compare the measurements and waveforms<br>iii. Transient Response in R-L-C series circuit |
|                  | 2 <sup>nd</sup> | 12. Construct the following circuits using P-Spice/MATLAB software and compare the measurements and waveforms<br>iii. Transient Response in R-L-C series circuit |
| 15 <sup>th</sup> | 1 <sup>st</sup> | 12. Construct the following circuits using P-Spice/MATLAB software and compare the measurements and waveforms<br>iii. Transient Response in R-L-C series circuit |
|                  | 2 <sup>nd</sup> | 12. Construct the following circuits using P-Spice/MATLAB software and compare the measurements and waveforms<br>iii. Transient Response in R-L-C series circuit |

  
 Signature of HOD(electrical)  
 14/09/22

  
 Signature of faculty  
 14/09/22