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| **Course Name:** | **Linear Integrated Circuits and Design** | **Semester:** | **V** |
| **Date of Performance:** | **07/08/2020** | **Batch No:** | **B1** |
| **Faculty Name:** | **Prof. Milind Marathe** | **Roll No:** | **1912052** |
| **Faculty Sign & Date:** |  | **Grade/Marks:** | **/25** |

**Experiment No: 5**

**Title: Precision Full Wave Rectifier**

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| **Aim and Objective of the Experiment:** |
| * To implement Precision Full wave rectifier using opamp |

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| **COs to be achieved:** |
| **CO3:** Design circuits using op-amps as nonlinear applications. |

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| **Theory:** |
| Precision rectifiers use op amp based circuits whereas ordinary rectifiers use simple diodes. The advantages of precision rectifiers are: The ability to rectify very small voltages (very much smaller than the diode forward voltage of 0.7V). The rectified output can be amplified if required.  A Precision full-wave rectifier is also known as absolute value circuit. This means the circuit output is the absolute value of the input voltage regardless of polarity.  The precision rectifier or super diode is an arrangement achieved with one or more op-amps (operational amplifiers) in order to have a circuit perform like a rectifier and an ideal diode. They can amplify the AC signal and then rectify it, or they can do both at once with a single operational amplifier.  The Precision Full Wave Rectifier circuits accept an ac signal at the input, inverts either the negative or the positive half, and delivers both the inverted and non-inverted halves at the output, shown in following figure. |

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| **Circuit Diagram:** |
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| **Stepwise-Procedure:** |
| 1. Make the connection as per the diagram shown 2. Apply AC signal as shown in diagram 3. Observe the waveform on CRO |

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| **Observation Table:** |
| |  |  |  | | --- | --- | --- | | Sr. No. | Vin(p-p) | Vo(p-p) | | 1 | 2V | 2V | |

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| **Calculation:** |
| **Design:-** |

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| **Waveforms:** |
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| **Post Lab Questions:** |
| 1. Explain the working of Precision half wave rectifier?     The precision rectifier is a configuration obtained with an OPAMP in order to have a circuit behave like an ideal diode and rectifier. It is very useful for high-precision signal processing. With the help of a precision rectifier the high-precision signal processing can be done very easily.  The Precision Full Wave Rectifier circuits accept an ac signal at the input, inverts either the negative or the positive half, and delivers both the inverted and noninverted halves at the output   1. Explain Super diode concept?   Super diode is called as a precision rectifier that is a combination of op-amp and diode.  These diodes become forward-biased when the voltage exceeds 0V.  The basic topology is far from ideal because it has significant limitations such as bandwidth, saturation, input-voltage range, etc.   1. Build up a Precision Full wave rectifier circuit in LTspice using a technique other than given in main circuit? Observe the input-output waveforms for this circuit? |

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| **Conclusion:** |
| We have successfully implemented and observed the working of precision full wave rectifier using IC 741 |

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| **Signature of faculty in-charge with Date:** |