|  |  |  |  |
| --- | --- | --- | --- |
| **Course Name:** | **Electronic Circuits Analysis and Design** | **Semester:** | **IV** |
| **Date of Performance:** | **22-02-2021** | **Batch No:** | **B2** |
| **Faculty Name:** | **Prof. Sonia Joshi** | **Roll No:** | **1912052** |
| **Faculty Sign & Date:** |  | **Grade/Marks:** | **/25** |

**Experiment No: 6**

**Title: To study high frequency Colpitt’s oscillator**

|  |
| --- |
| **Aim and Objective of the Experiment: Implementation of high frequency Colpitt’s oscillator** |
| 1) To calculate the frequency of the Oscillator  . |

|  |
| --- |
| **COs to be achieved:** |
| CO 3. Understand the concept of feedback and apply it to amplifiers and oscillators |

|  |
| --- |
| **Theory:** |
| An oscillator is used to produce electronic signal with oscillating periods. Eg: Sine wave, square wave etc.. Oscillators are broadly classified into two – linear oscillators and non-linear oscillators. As the name implies, linear oscillators are used to produce linear or sinusiodal waveforms. Whereas, non-linear oscillators are used to produce non-linear (non-sinusoidal output waveforms). All types of electronic oscillators use their input voltage to control the oscillation frequency.  Colpitts Oscillator is an electronic oscillator which uses an inductor and capacitors to form an **LC oscillator circuit.**  Colpitts oscillator is generally used in RF applications and the typical operating range is 20KHz to 300MHz. In Colpitts oscillator, the capacitive voltage divider setup in the tank circuit works as the feed back source and this arrangement gives better frequency stability when compared to the Hartley oscillator which uses an inductive voltage divider setup for feedback. |

|  |
| --- |
| **Circuit Diagram:** |
|  |

|  |
| --- |
| **Stepwise-Procedure:** |
| 1. Make the connections as per the Circuit diagram. 2. Select the transient response from Edit Simulation command 3. Calculate Frequency from the waveform 4. Measure the Amplitude of the sinusoidal waveform |

|  |
| --- |
| **Observation Table:** |
| |  |  | | --- | --- | | Colpitt’s oscillator | Observed values | | Time period of the output oscillations | 14.095us | | Frequency of oscillations | 71.4k | | Amplitude of output oscillations | 445.798 |   Tabular Results (should include the comparison of theoretical and practical values)   |  |  |  | | --- | --- | --- | | Colpitt’s oscillator | Theoretical value | Observed value | | Frequency of oscillations | 72k | 71.4k | |

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

|  |
| --- |
| **Waveform** |
| 71.4k |

|  |
| --- |
| **Post Lab Subjective/Objective type Questions:** |
| 1. Design RC Phase Oscillator using BJT to have the frequency of oscillator1.5Khz use147A.      1. Draw a circuit Diagram of Hartely oscillator and explain how it is different from Colpitt Oscillator |

|  |
| --- |
| **Conclusion:** |
| We understood the concept of feedback and apply it to amplifiers and oscillators.  And implemented a high frequency colpitt oscillator. |

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