**EXPERIMENT-9**

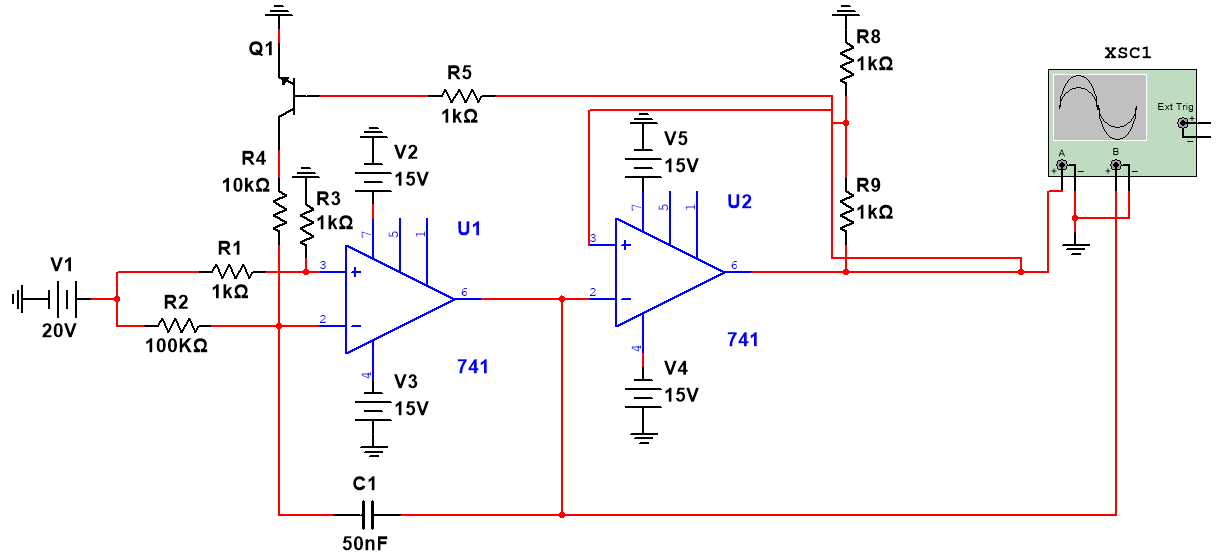
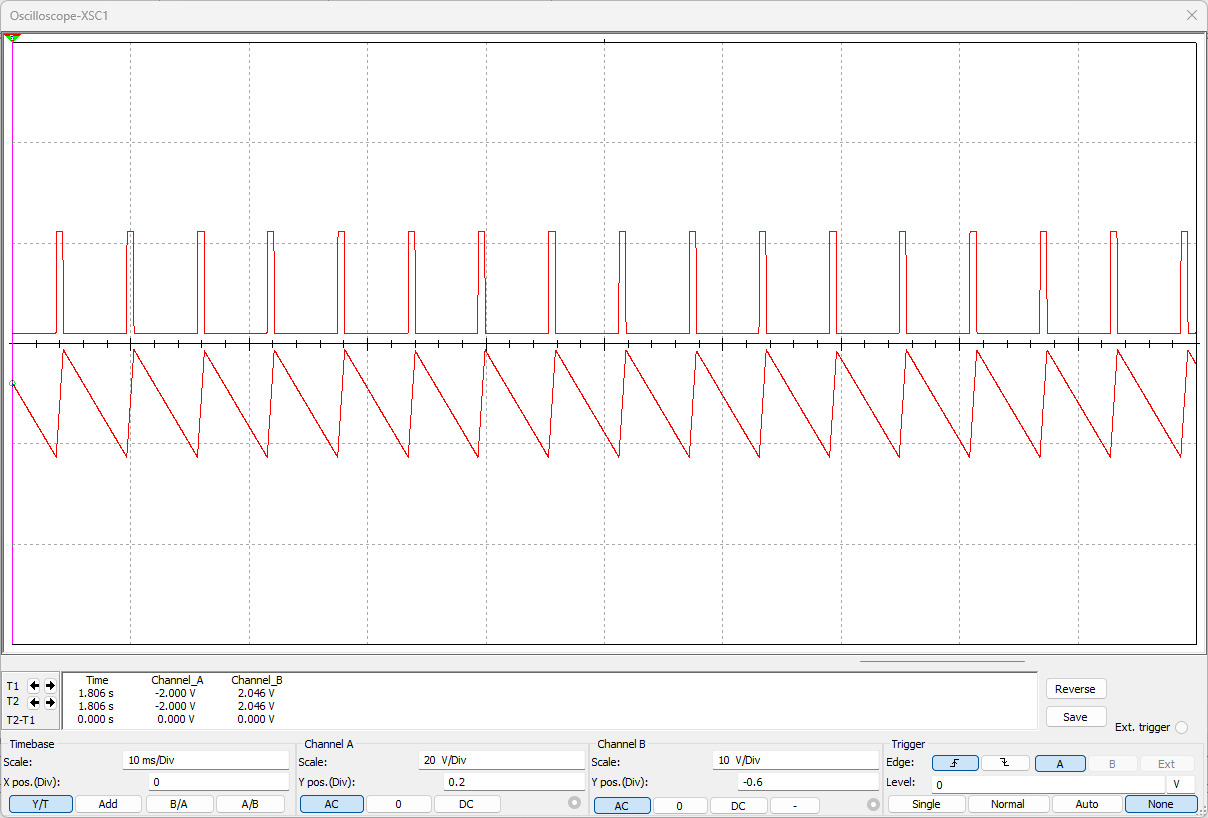
**Voltage Controlled Oscillator**

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1. To Design a Voltage Controlled Oscillator.
2. **Aim:**
3. **Apparatus [Hardware]:**
4. Resistors (1k, 100k,10k)
5. Capacitors (50nF)
6. OPAMP [LM 741]
7. Regulated Power Supply
8. Transistor (BC107)
9. DSO
10. **Theory:**

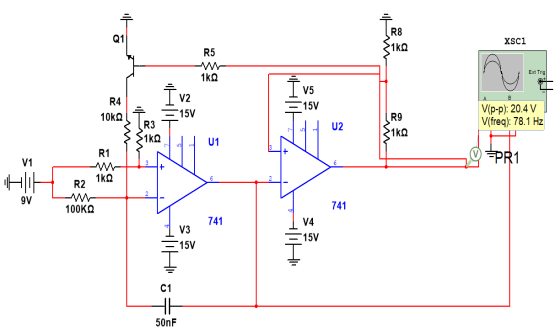
A Voltage-Controlled Oscillator (VCO) is an electronic oscillator whose oscillation frequency is controlled by a voltage input. The frequency of the output signal varies in relation to the amplitude of the input control voltage. VCO’s are widely used in signal generators, phase-locked loops, and frequency modulation applications.

1. **Procedure:**
2. Connect the circuit as per the circuit diagram
3. Apply input as per the requirements and observe the outputs.
4. Observe the outputs of VCO using a DSO.
5. Check the voltage and frequency of the generated waveform(square).
6. **Simulation Observation:**

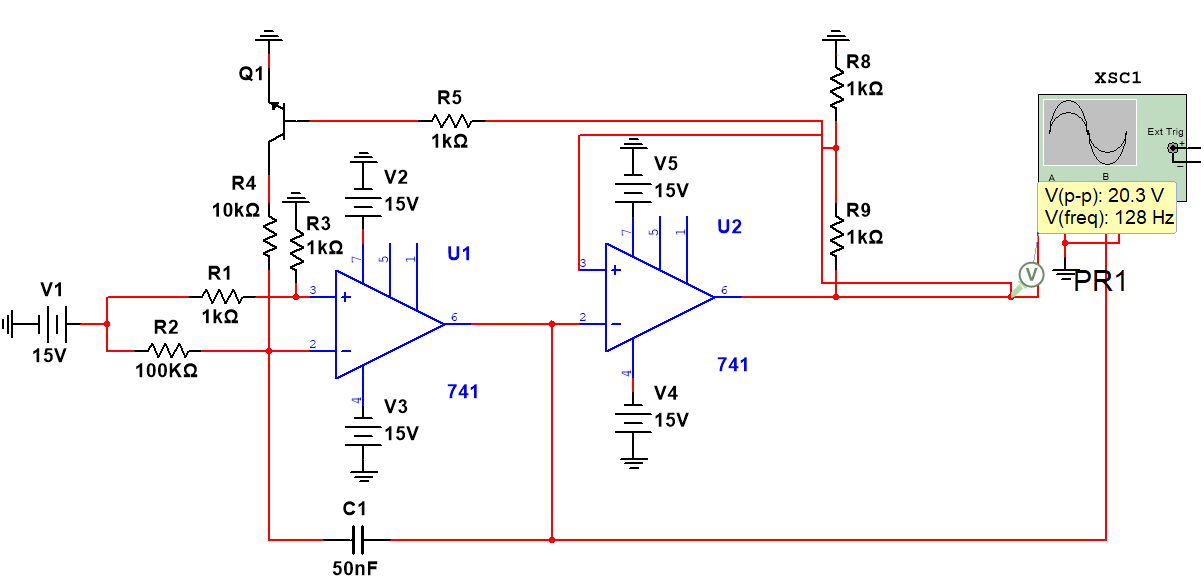
**Fig 1: VCO circuit**

**Case 1: = 9V**

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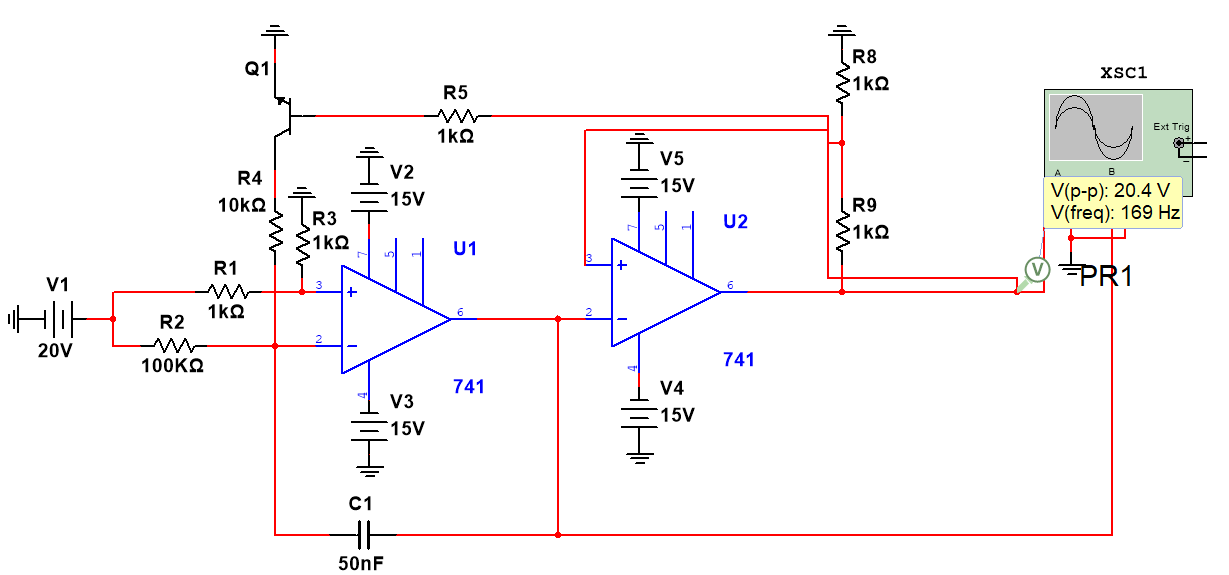
For input = 9V, Square wave of frequency 78.1Hz is generated.

**Case 2: = 15V**

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For input = 15V, square wave of frequency 128Hz is generated.

**Case 2: = 20V**

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For input = 20V, square wave of frequency 169Hz is generated.

**CONCLUSION:**

From above cases we have observed that as input is increases, frequency of square wave is increases.

1. **Result:**

Hence, we have designed, implemented and verified VCO.

Signature of the Faculty