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Sec: 08 CSE350 Lab 5

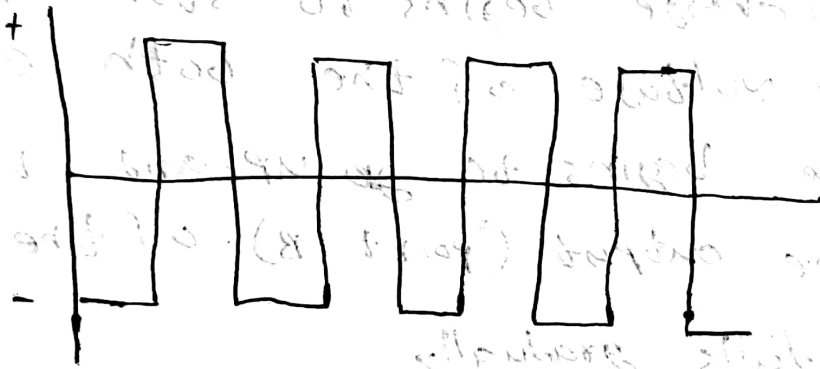
## Experiment: Analysis of triangular wave generator.

### Report:

1.

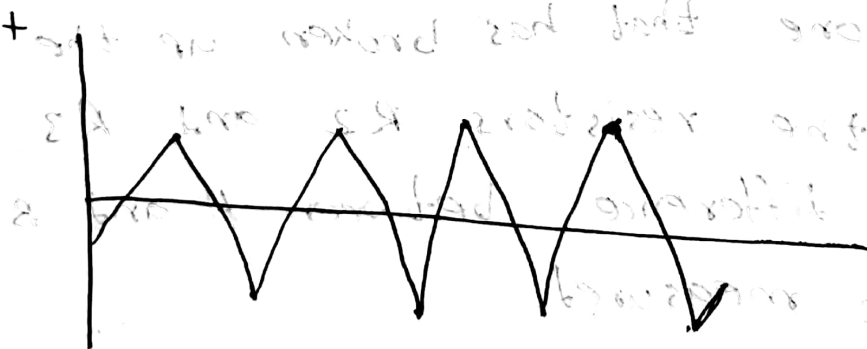
point

A



point

B



2.

When the Schmitt circuit is on, the output (point A) turns positive, or negative saturated voltage. When A point becomes positive, the current flows through the capacitor C through the resistor  $R_1$ .

When charge begins to store up in capacitor, voltage of the both edges of capacitor begins to go up and the voltage of the output (point B) of the integration circuit falls gradually.

The C point of IC1's positive input terminal is the one that has broken up the circuit and with the resistors  $R_2$  and  $R_3$ , the voltage difference between A and B points can be measured.

When the voltage of the B point begins to drop, so does the voltage of the C point.

When the voltage of the C point falls below 0V, the voltage of the output (A point) of the transistor falls below 0V.

The Schmitt circuit rapidly goes toward the negative <sup>as</sup> for the C point's voltage to drop below 0V.

The requirement is  $R_2 > R_3$ .

Then the flow of the current to the capacitor C reverses and the current flows through the direction of the A point through the resistor  $R_1$ . With this, the voltage of the B point rises gradually.

When the voltage at C point exceeds 0V, the Schmitt circuit's output (A point) quickly transforms into a plus. This shifts the B point in the negative direction.

For the voltage of the C point to exceed 0V, the condition  $R_2 > R_3$  is required.

Finally, it repeats this action, A point gives square wave output and B point gives the triangular waveform output.



3. No, the integrator circuit cannot be implemented with an inductor.

It is because here in this circuit,

the process works by changing the voltage up and down and capacitor

only resists the voltage but by capacitor current flows and stores up and sometimes it makes a point positive and negative. By this process, we get triangular waveform as output which we can't get by inductor as inductor resists current flowing.

## 4. Data Table:

Frequency (theoretical),

we know,

$$f = \frac{1}{T}$$

$$T =$$

$$4 \times R_1 \times C$$

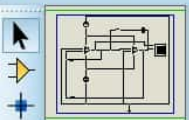
$$\times \frac{R_2}{R_3}$$

$$= \frac{1}{4 \times 10 \times 10^3 \times 0.4 \times 10^{-6}}$$

$$\times \frac{10 \times 10^3}{4 \times 10^3}$$

$$= 156.25 \text{ Hz}$$

Theoretical Frequency (Hz)	Experimental Time period, T (ms)	Experimental Frequency, F (Hz)
156.25	6.50	$\frac{1}{T} = \frac{1}{6.50 \times 10^{-3}}$ $= 153.846$



DEVICES  
BUTTON  
CAPACITOR  
DS1990  
RES  
UA741  
VSOURCE

