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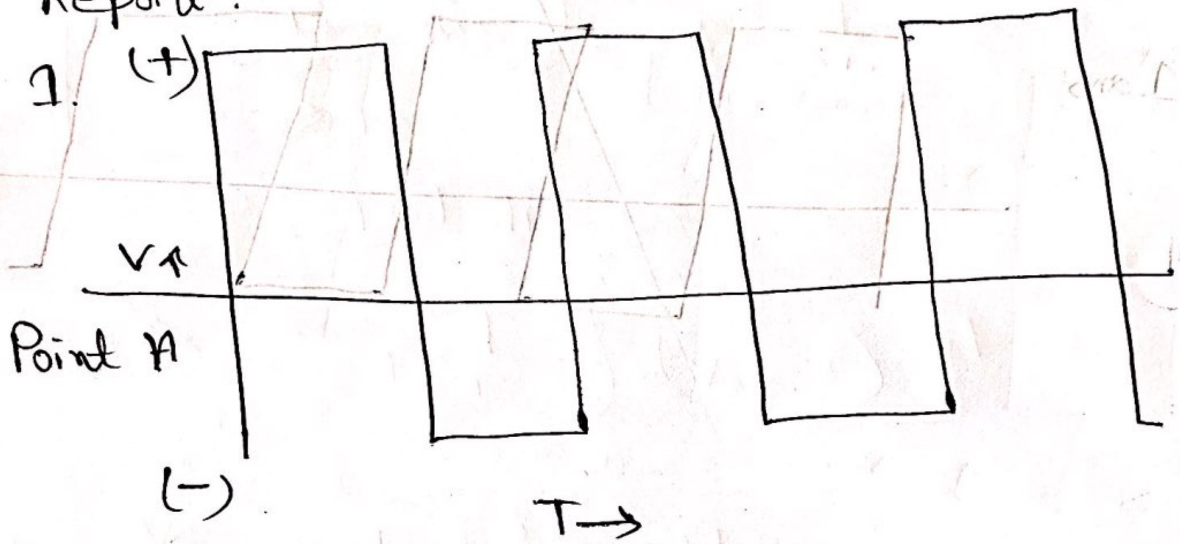
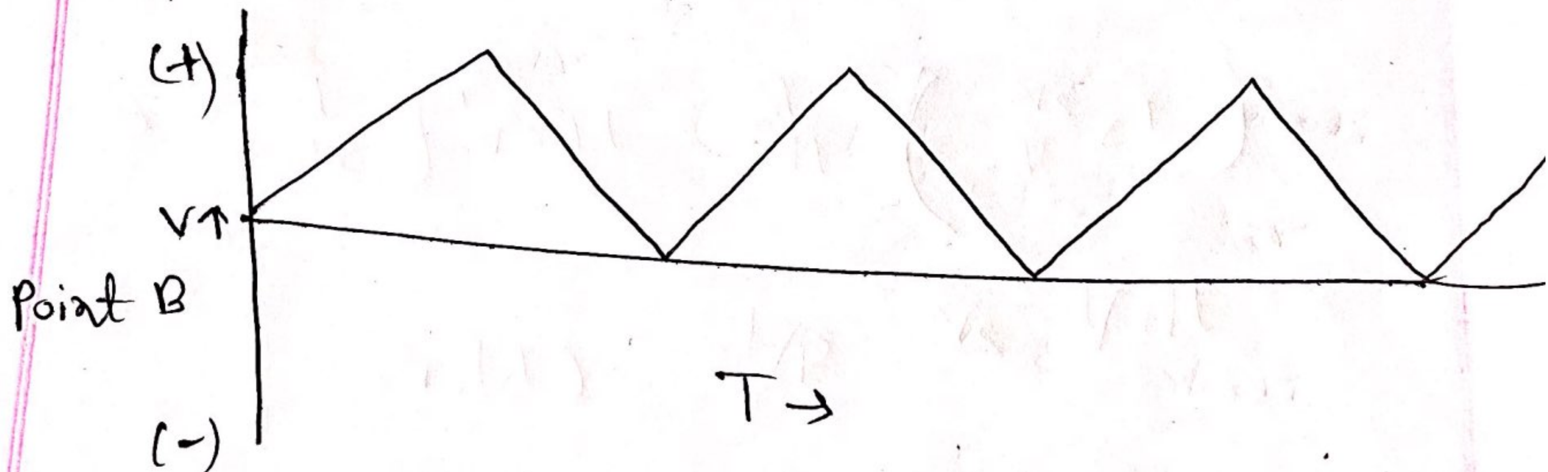
Sec- 04

Lab 05

Report :

1.





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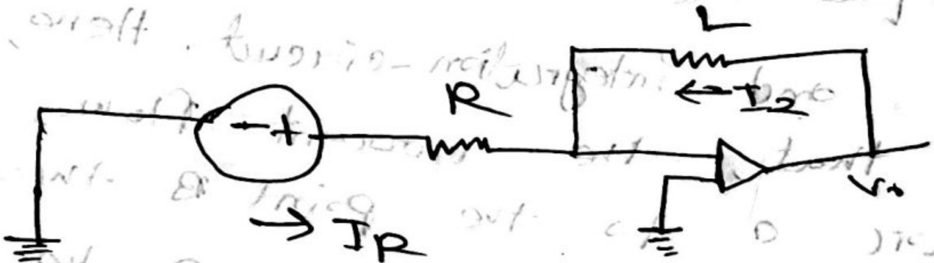
2. The above circuit is triangular coave generator. Triangular waves are periodic and non-sinousoidal from a triangular shape. It has equal-rise and fall-times. It is made op schmitt and integration-circuit. Here, we can see that, the current flows through the capacitor c to the point B through R1 and due to this, c stores up the electric change. There-fore, the voltage of the output point A becomes positive and the point B falls. However, when the voltage of c reaches below 0, ~~then~~ then voltage of output point A turns into negative and output point B rises. It actually happens when the current flows through capacitor in reverse to the point A under the condition of R2 > R3. After the increases of voltage of C(c>0), same thing will be repeated and the output A and B will be generated.

3. The integrator circuit cannot be implemented with an inductor. If we use an inductor instead of capacitor it'll be a differential circuit.



$$\therefore I_R + I_L = 0$$

$$\Rightarrow \frac{V_S - 0}{R} + \frac{1}{L}\int_{-\infty}^{t} (V_o - 0)\, dt = 0$$

$$\Rightarrow \frac{V_S}{R} + \frac{1}{L}\int_{-\infty}^{t} V_o\, dt = 0$$

$$\Rightarrow \frac{d}{dt}\int_{-\infty}^{t} V_o\, dt = \frac{d}{dt}\left(-\frac{V_S}{R} \times L\right)$$

$$\therefore V_o(t) = -L/R \;\; V_S \;\; d/dt$$

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<u>Data table</u>

given, $R_1 = 10 k\Omega$ $R_2 = 10 k\Omega$ $R_3 = 4 k\Omega$

$C = 0.4 \mu F = 0.4 \times 10^{-6} F$

$$\therefore f = \left(\frac{1}{4 \times R_1 \times C}\right) \times \frac{R_2}{R_3}$$

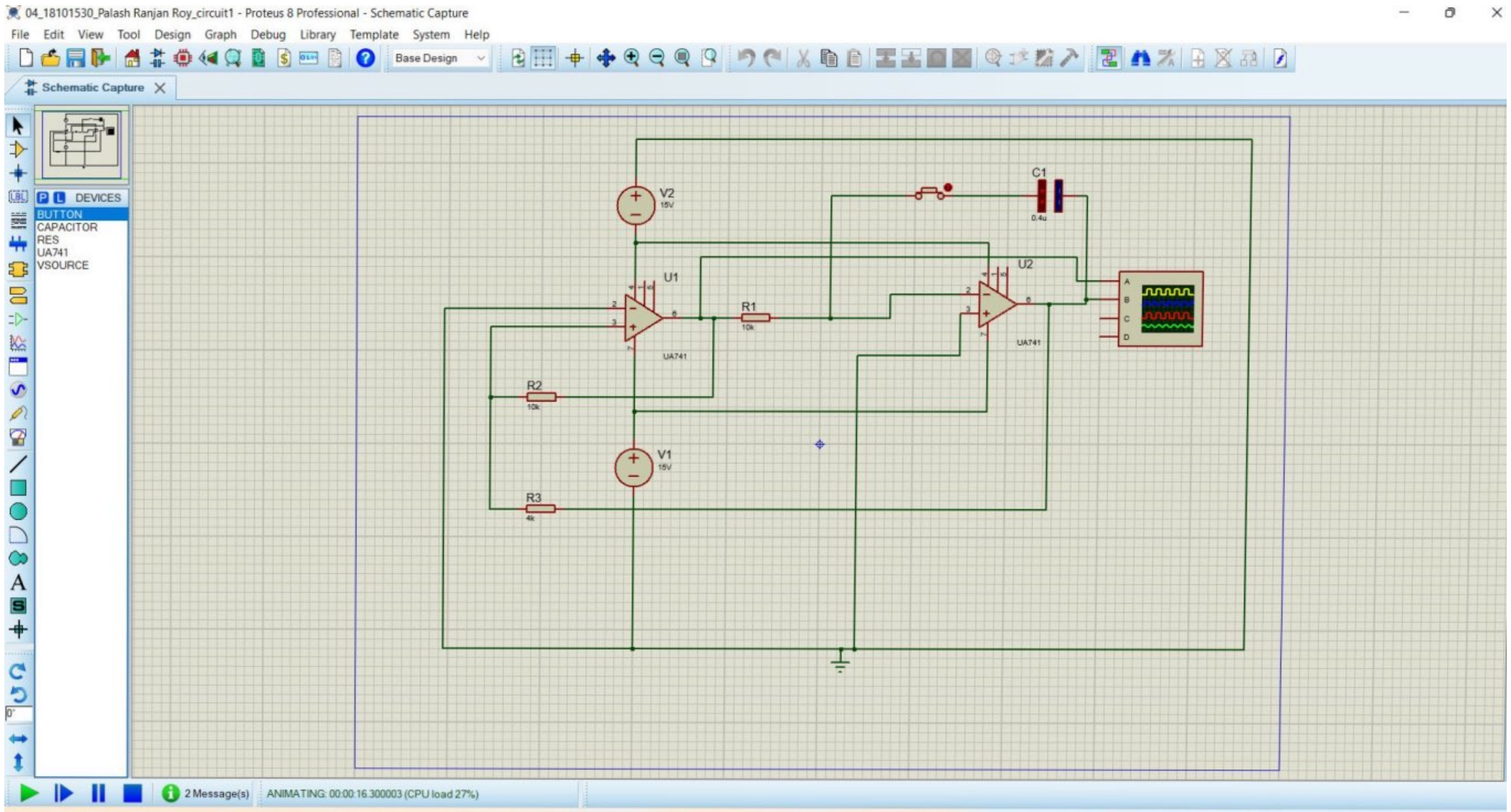
$$= \frac{1}{(4 \times 10 \times 10^3 \times 0.4 \times 10^{-6})} \times \frac{10 \times 10^3}{4 \times 10^3}$$

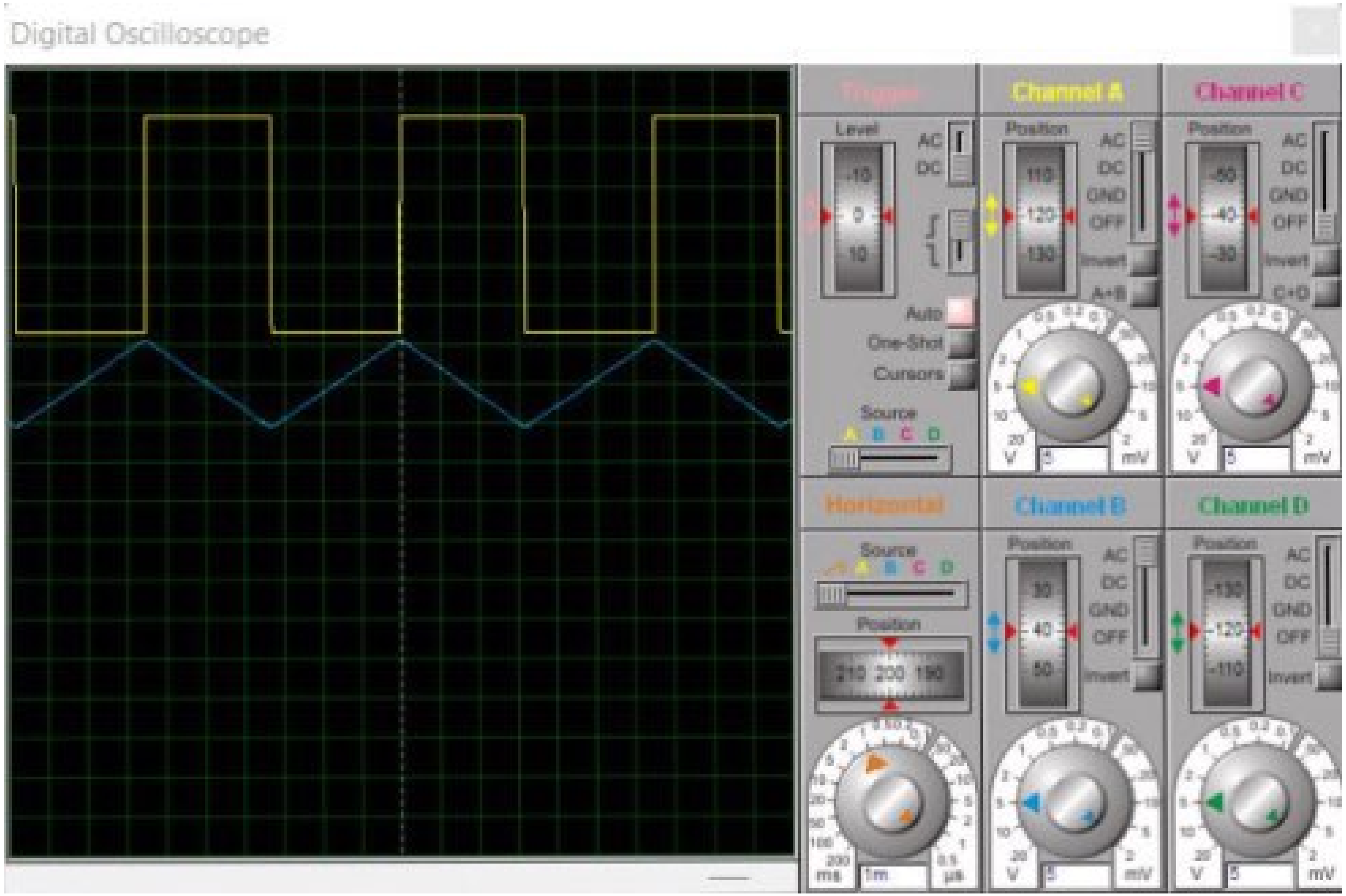
$$= 156.25 \text{ Hz}$$

So, Exponential time period $= -19.55 - (-26.10)$
$= 6.55 \approx 6.6 ms$

Experimental Frequency $= \frac{1}{6.6} = 0.15152 KHz$
$= 151.52 HZ$

Theoritical Frequency (Hz)	Experimental time Period, T(ms)	Experimental Frequency, F (Hz)
156.25 HZ	6.6 ms	151.52 KHz


04_18101530_Palash Ranjan Roy_circuit1 - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Schematic Capture
DEVICES
BUTTON
CAPACITOR
RES
UA741
VSOURCE
V2
V1
U1
U2
R1
R2
R3
C1
2 Message(s)
ANIMATING: 00:00:16.300003 (CPU load 27%)


Digital Oscilloscope
Trigger
Channel A
Channel C
Horizontal
Channel B
Channel D
Level
Position
AC
DC
GND
OFF
Invert
A+B
C+D
Auto
One-Shot
Cursors
Source