By:

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22BEC1503

DIFFERENTIATOR AND INTEGRATOR

Experiment no:3

AIM:

To perform transient analysis of differentiator and integrator constructed using ic 741opamp, using LTSpice software.

APPARATUS REQUIRED:

LTSpice software updated with latest one.

THEORY:

An op-amp based differentiator produces an output that is equal to the differential of the input voltage applied to its inverting terminal. The circuit diagram of an op-amp based differentiator includes a capacitor in the feedback loop and a resistor in series with the input signal. An op-amp based integrator produces an output that is an integral of the input voltage applied to its inverting terminal. The circuit diagram of an op-amp based integrator includes a capacitor in the feedback loop and a resistor in series with the input signal

PROCEDURE:

1.Import the lm741 module to LtSpice software and then construct the given circuit of differentiator first .

2.Using advanced options , generate a square wave pulse using the Setting-PULSE(0 1 0 0 0 0.005 0.01)

3. Now perform Transient Analysis for the above constructed circuit using the following command -.tran 0 100ms 2ms 10 ms.

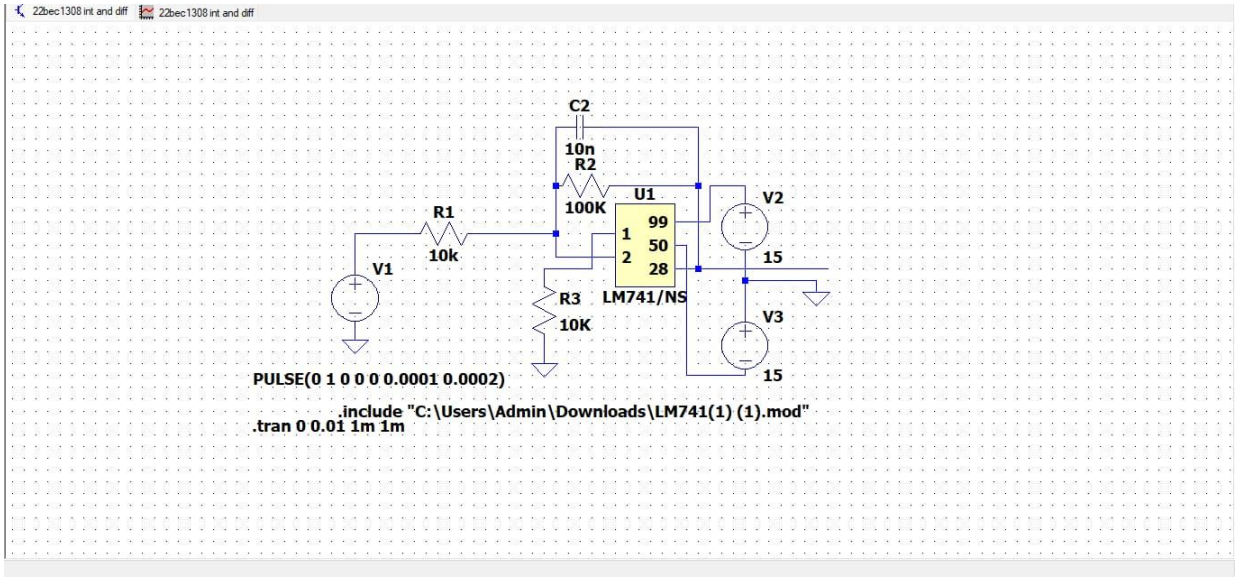
4.Similarly Construct a circuit for Integrator using ic741.

5. Using advanced options , generate a square wave pulse using the Setting-PULSE(0 1 0 0 0 0.0001 0.0002)

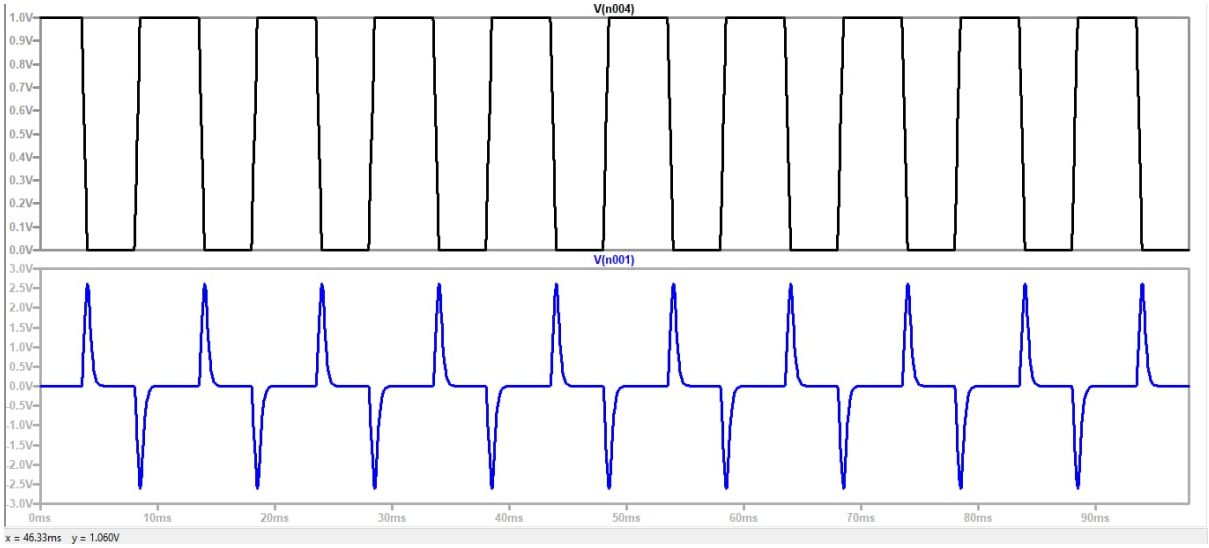
6. Now perform Transient Analysis for the above constructed circuit using the following command -.tran 0 0.01 1m 1m.

CIRCUIT :

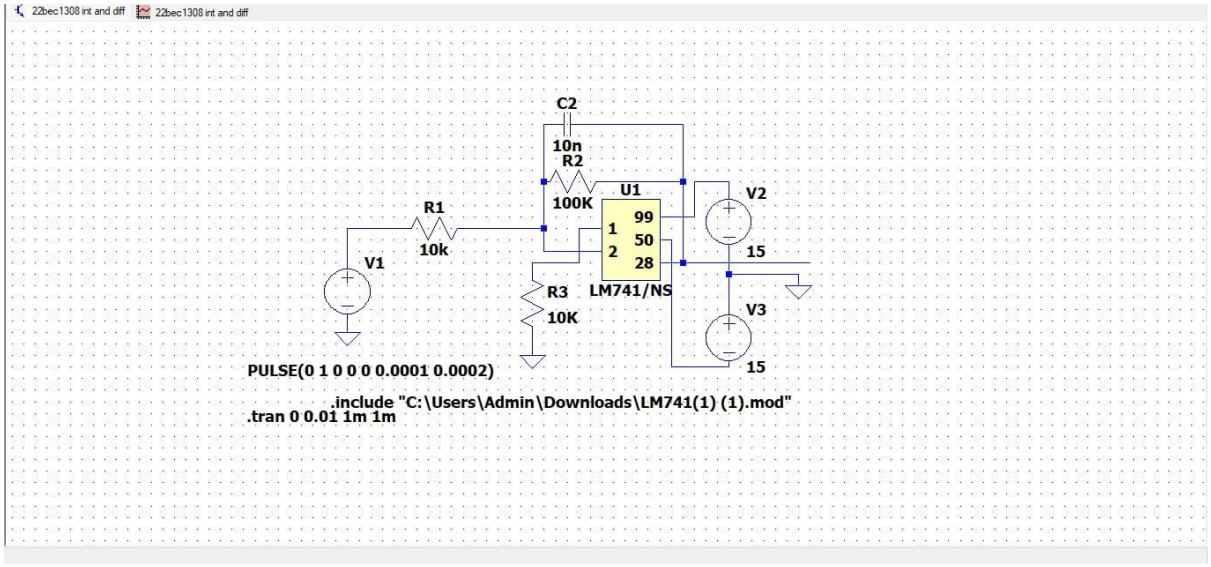
1.Differentiator:



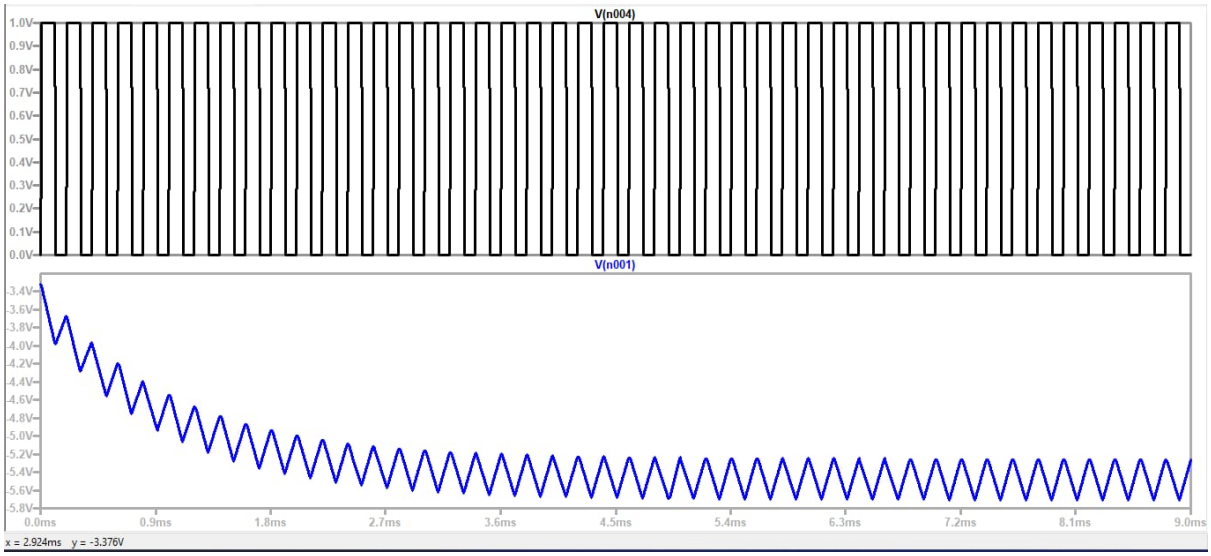
OUTPUT WAVEFORM:



2.INTEGRATOR:



OUTPUT WAVEFORM:



RESULT:

Hence performed transient analysis of differentiator and integrator constructed using ic 741 and verified the output for a square wavepulse.