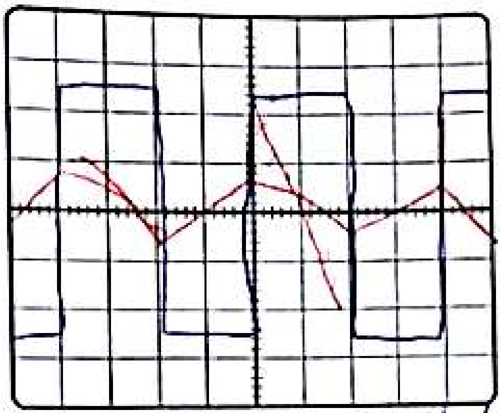
Report of Experiment 10

Operational Amplifier Applications (2)

Part A: The Inverting Integrator circuit

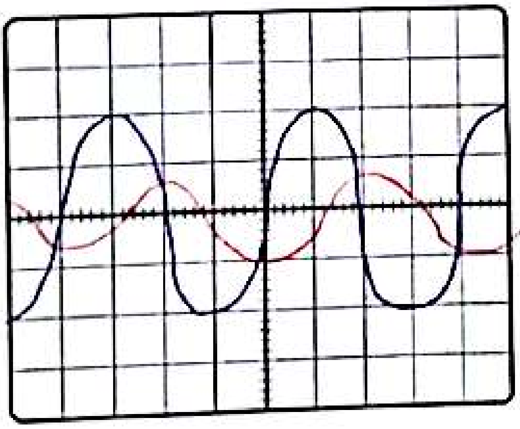


5- Comment on the output signal and its relation to the input signal.

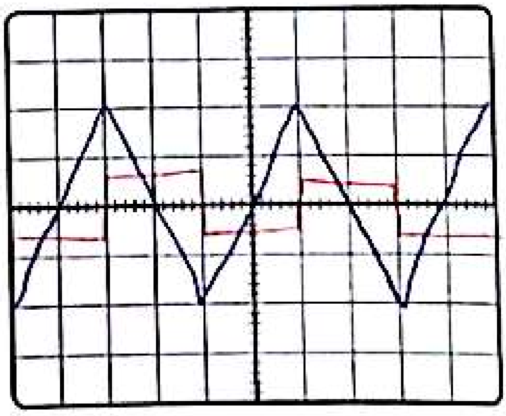
the output signal is the inverted itegral of the input signal

Part B: The Inverting Differentiator circuit

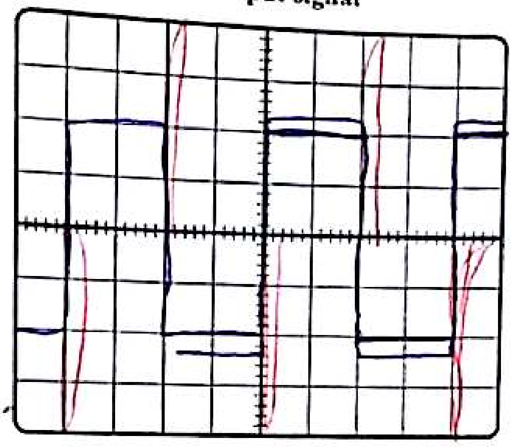
Sine wave input signal



Triangle wave input signal



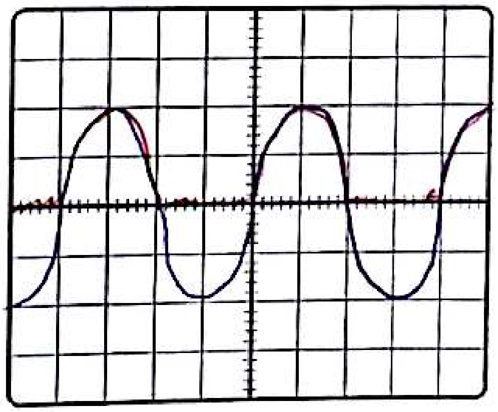
Square wave input signal



5- Comment on the output signal and its relation to the input signal.

The output signal is the inverted differential of the input signal

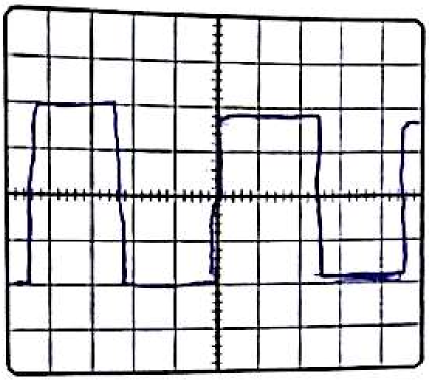
Part C: The Half wave Precision Rectifier circuit



5- What is the main difference between the rectified signals if we use Op-amp instead of using diode only as in Exp2?

In the diode experiment there's a difference of V_γ between output and input and in the op-amp they are exactly the same

Part D: The Square Wave generator circuit



3- Measure the frequency of the output signal from the scope screen and compare it with the calculated frequency.

measured $(4.5 \times 500\mu s)^{-1} = 444.444$

$T = 2RC \ln\left(\frac{2R_2}{R_1} + 1\right)$

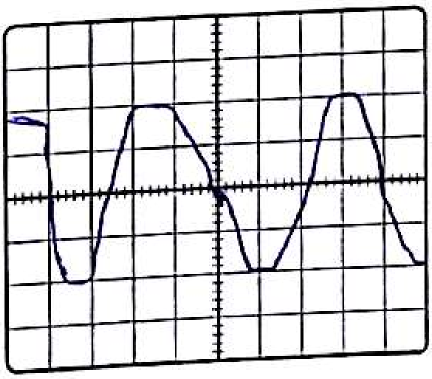
$= 2 \cdot 10K \cdot 0.1\mu \ln\left(\frac{2 \cdot 15K}{15K} + 1\right)$

$T^{-1} = 455.11$

4- Explain how can we change the frequency of the output signal?

by changing the resistors and capacitance

Part E: The Sine Wave Oscillator circuit



3- Measure the frequency of the output signal from the scope screen and compare it with the calculated frequency.

measure

$f = 1538.46$

calculated

$f = \frac{1}{2\pi R_1 C_1} = \frac{1}{2\pi \cdot (1K) \cdot (0.1\mu)}$

$= 1591.54$

4- Explain how can we change the frequency of the output signal?

by changing R_1 & C_1