CSE251: ELECTRONIC DEVICES AND CIRCUITS

EXPERIMENT 2 :

STUDY OF OP-AMP : INVERTING SUMMING AMPLIFIER , SCHMITT TRIGGER

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3. Add a brief Discussion at the end of the report.

Data Sheet

Task-01:

$R_f = 100.1\,k$; $R_1 = 99.4\,k$
$R_2 = 99.1\,k$
$R_3 = 98.9\,k$

from multimeter, $v_{I1} =$ 5V
from multimeter, $v_{I2} =$ 1V
from multimeter, $v_{I3} =$ 0.5V
Output Amplitude from equation, $v_O = -(\frac{R_F}{R_1} \times v_{I1} + \frac{R_F}{R_2} \times v_{I2} + \frac{R_F}{R_3} \times v_{I3}) =$ -6.5V
Output Amplitude from multimeter, $v_O =$ ~~-6.07V~~ -6.75V

Task-02:

$V_S^+ = +5V$
$V_S^- = -5V$

R_1	From Equation, $V_{TH} = -\left(\frac{R_1}{R_2}\right) V_S^-$	From Oscilloscope, V_{TH}	From Equation, $V_{TL} = -\left(\frac{R_1}{R_2}\right) V_S^+$	From Oscilloscope, V_{TL}
25 kΩ		1.92		-1.88
50 kΩ		2.89		-3.16

7/2/23

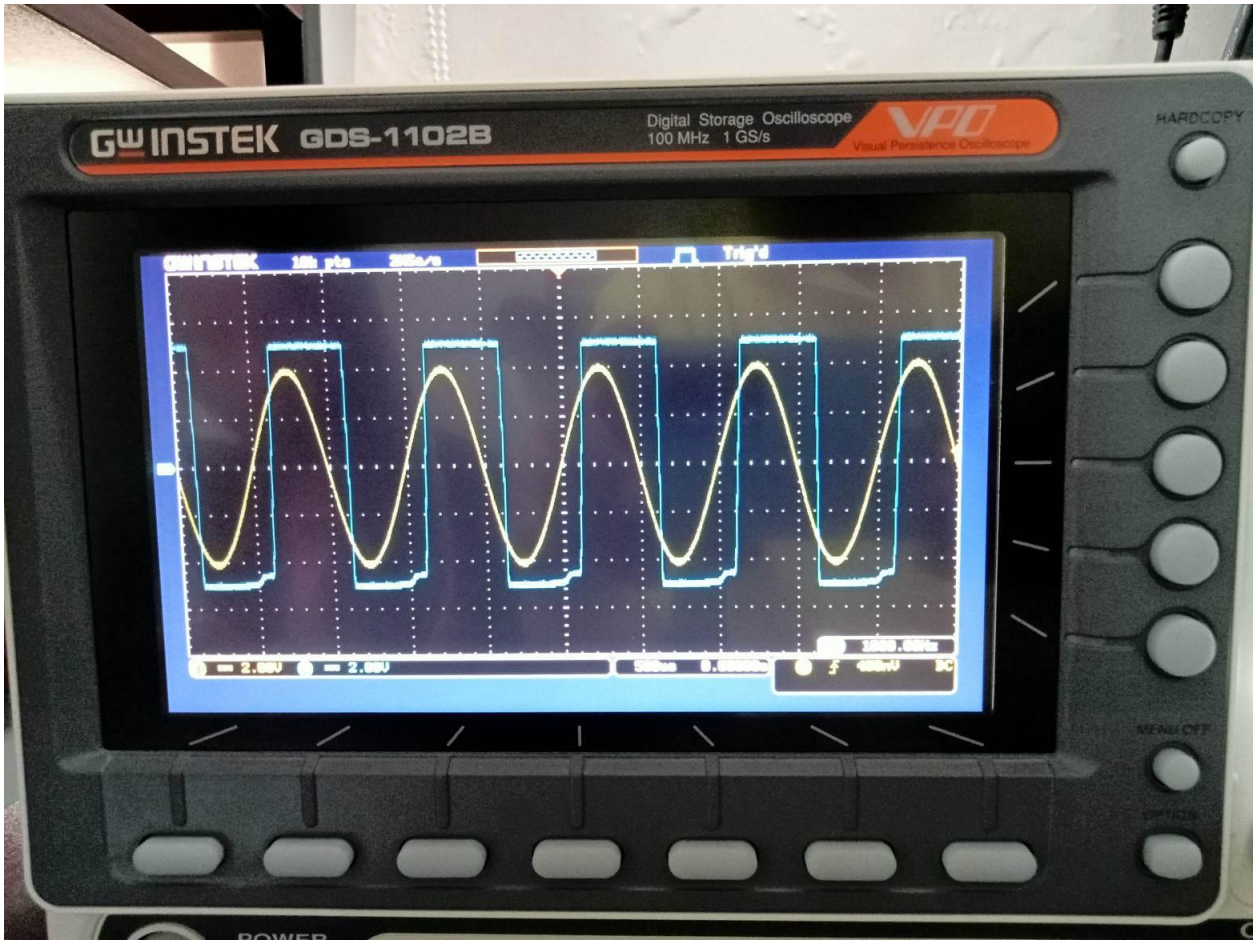
Task-03:

R_1	$p = R_2/R_1$	From Equation, $V_{TH} = 2.5 + \frac{2.5}{p}$	From Oscilloscope, V_{TH}	From Equation, $V_{TL} = 2.5 - \frac{2.5}{p}$	From Oscilloscope, V_{TL}
25 kΩ					
50 kΩ			+9		

DISCUSSION

For task 1, three 100 KΩ resistors are connected parallely to the 2nd pin of op-amp IC. A potentiometer set at 100 KΩ is connected with the 2nd pin and the 6th pin. 2nd pin is the input and 6th pin is the output. The 3rd pin is connected to the ground. 4th ~~and~~ pin is connected to -15V port of trainer board and set to -8V. 7th pin is connected to 15V port of trainer board and set to 8V. The 1st resistor connected to 2nd pin is connected to 5V port of the trainer board. The 2nd resistor is connected to DC power supply set at 1V and the 3rd resistor is connected to another DC supply set at 0.5V. Voltage is measured using multimeter, set to measure voltage, in the 6th pin.

For task 2, 100 KΩ resistor and potentiometer set at 100 KΩ ~~are~~ are connected to the 3rd pin. The 3rd pin is the input. ~~Voltage of~~ 4V voltage and 1KΩ frequency are set on the function generator and this is also connected to the 3rd pin. Channel-1 of oscilloscope is connected to 3rd pin. 2nd pin is grounded. One ~~pot~~ terminal of potentiometer is connected to 6th pin which is the output. Channel-2 oscilloscope is connected to the 6th pin. 4th and 7th pins are connected to -15V and 15V of the trainer board and adjusted to -8V and 8V respectively. The knob of potentiometer is moved to change the resistance to 25 KΩ and 50 KΩ and the higher intersection of the two curves is the V_{TH} and the lower intersection is the V_{Th} which is obtained using horizontal cursors in the oscilloscope.


GW INSTEK GDS-1102B
Digital Storage Oscilloscope
100 MHz 1 GS/s
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Visual Persistence Oscilloscope
HARDCOPY
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