Exp no - 1

Date → 24/07/2020

19BEE0032

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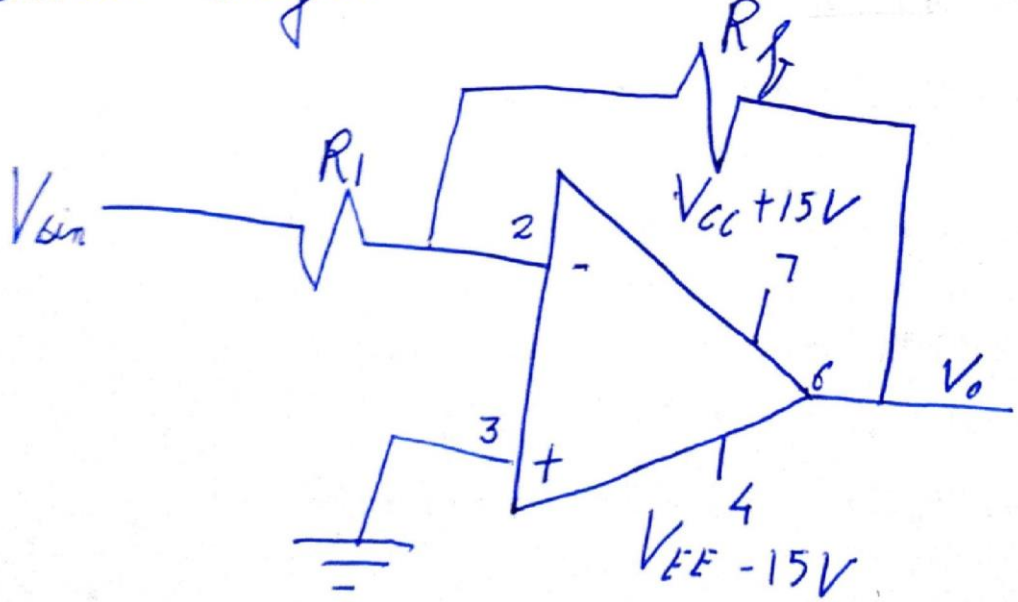
Aim → Design of inverting and non-inverting amplifier using Op-Amp IC 741.

Apparatus required →

Name of item	Specification	Quantity
Op-amp	IC 741 [LM741]	2
Resistor	1 kΩ	4
Voltage source	DC → 15V	4
	AC → amp → 1 f_r → 50	2

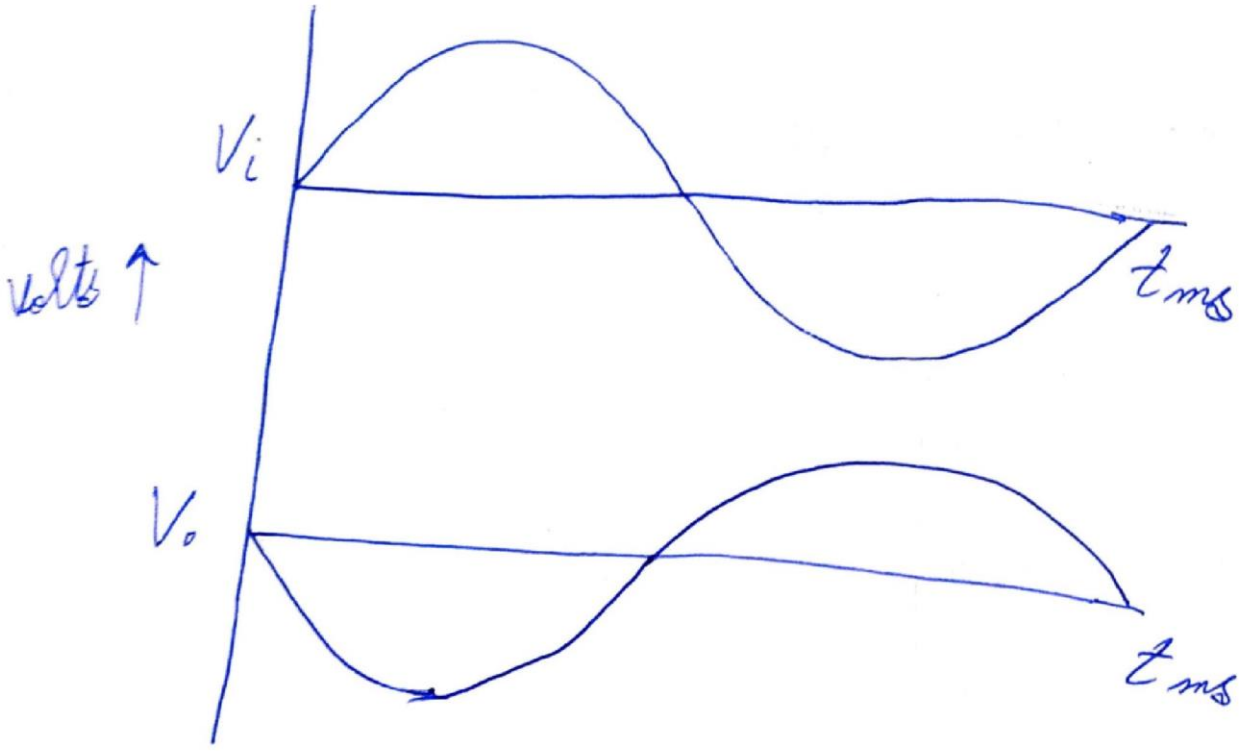
Circuit diagram →



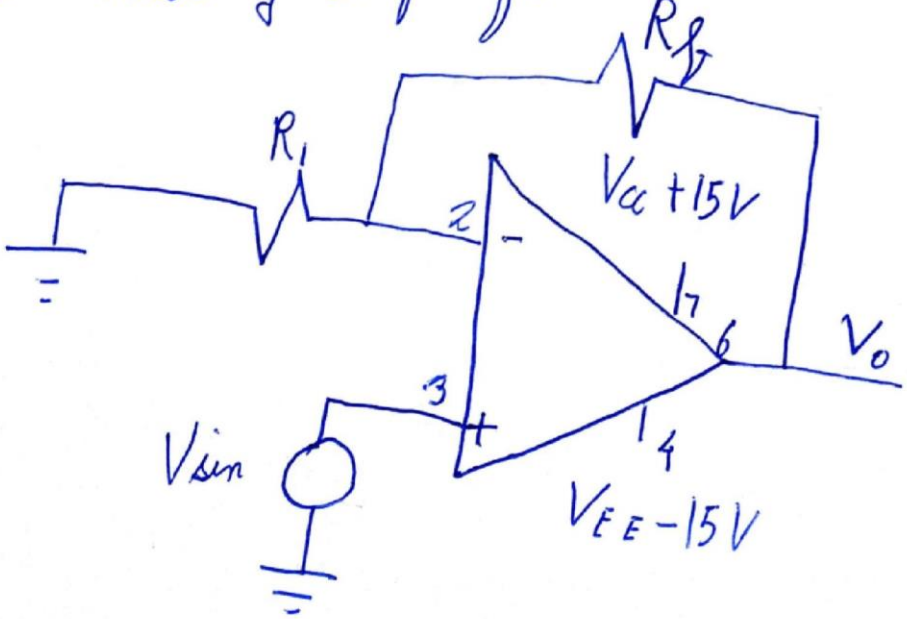
$$V_o = -\frac{R_f}{R_1} V_i$$

Phase shift between input and output = 180°

Model graph →



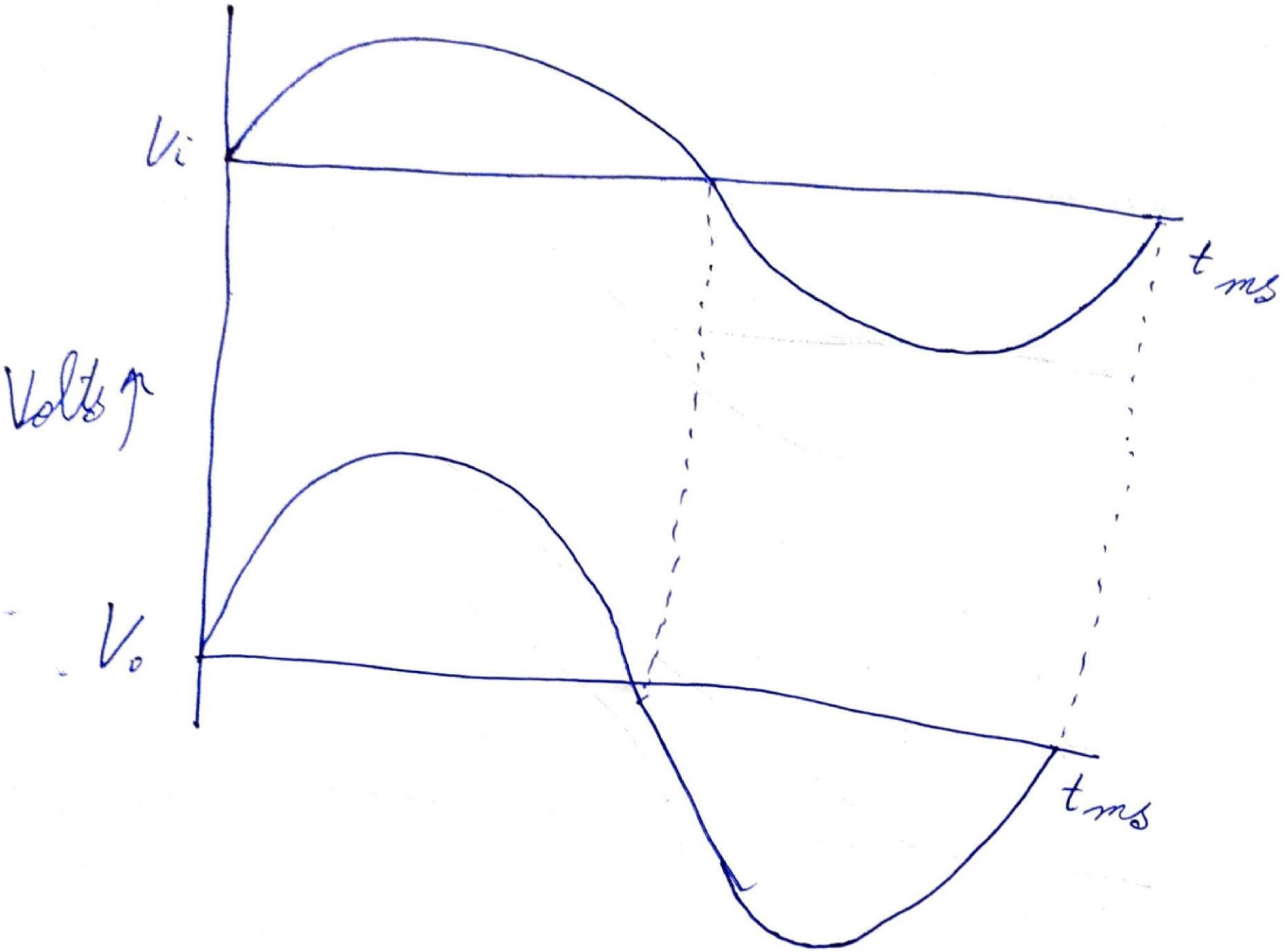
Non-inverting amplifier



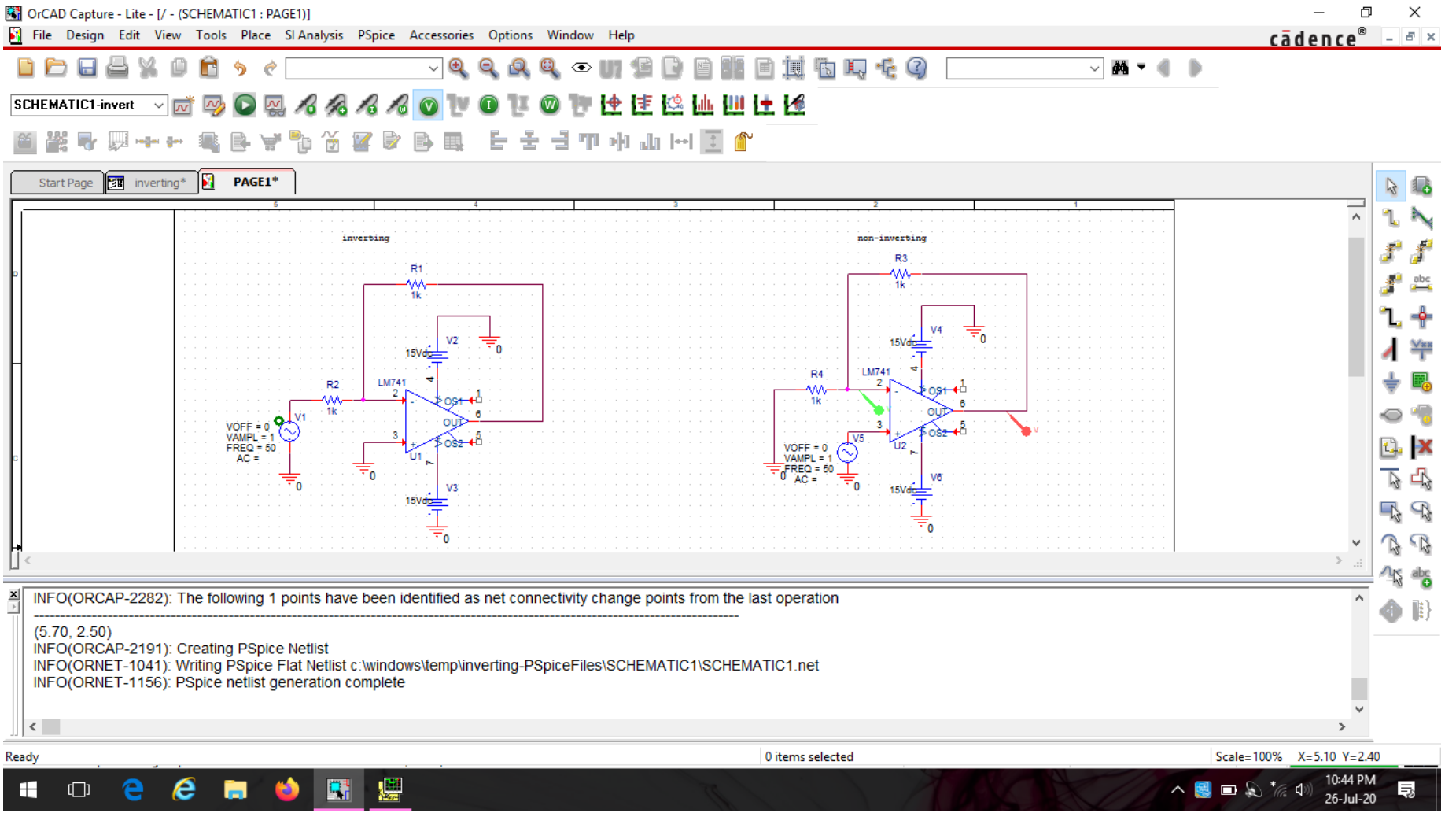
$$V_o = \left(1 + \frac{R_f}{R_i}\right) V_i$$

Phase difference between input and output = 0°

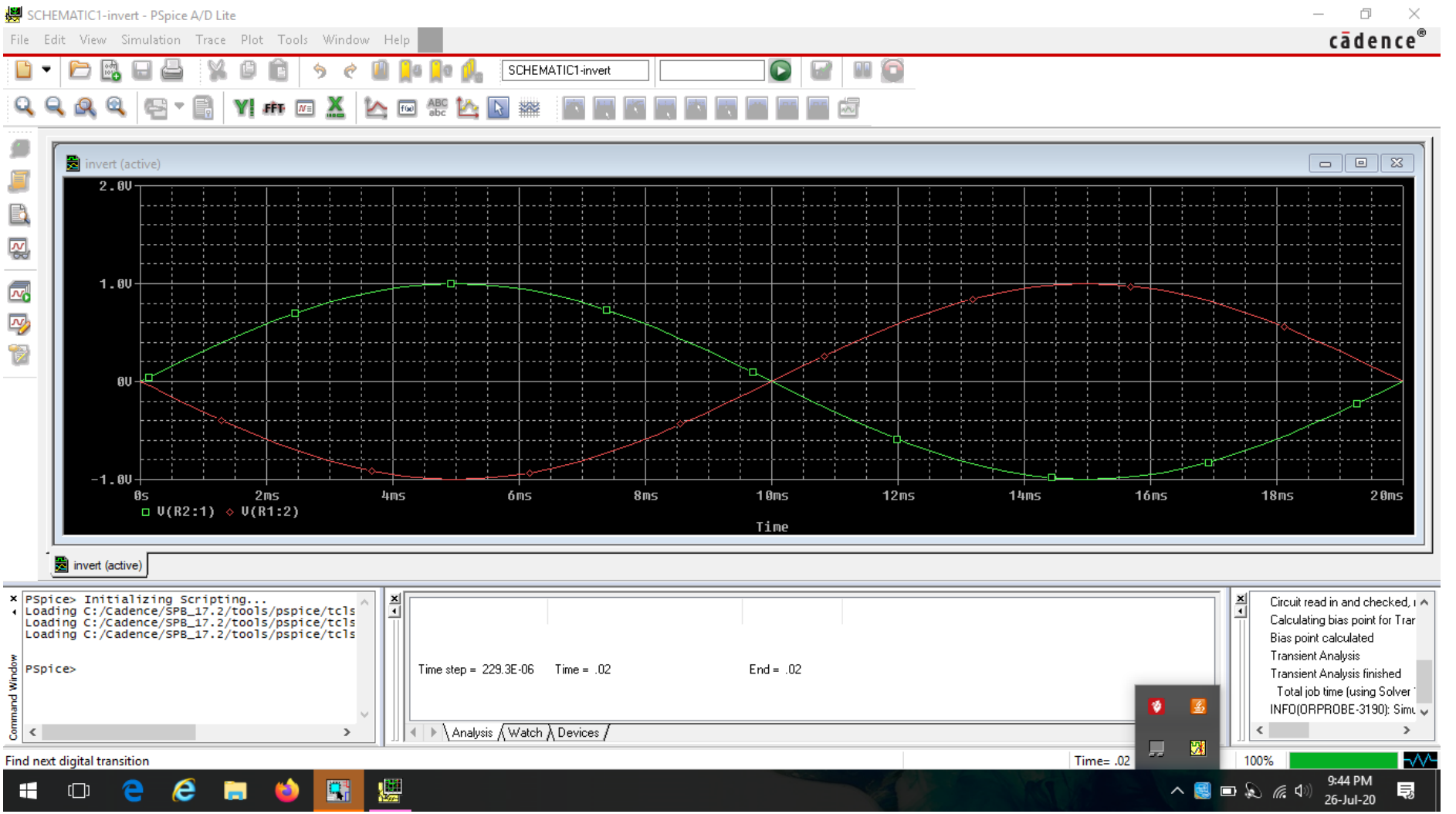
Model graph


V_i
t_{ms}
Volts ↑
V_o
t_{ms}

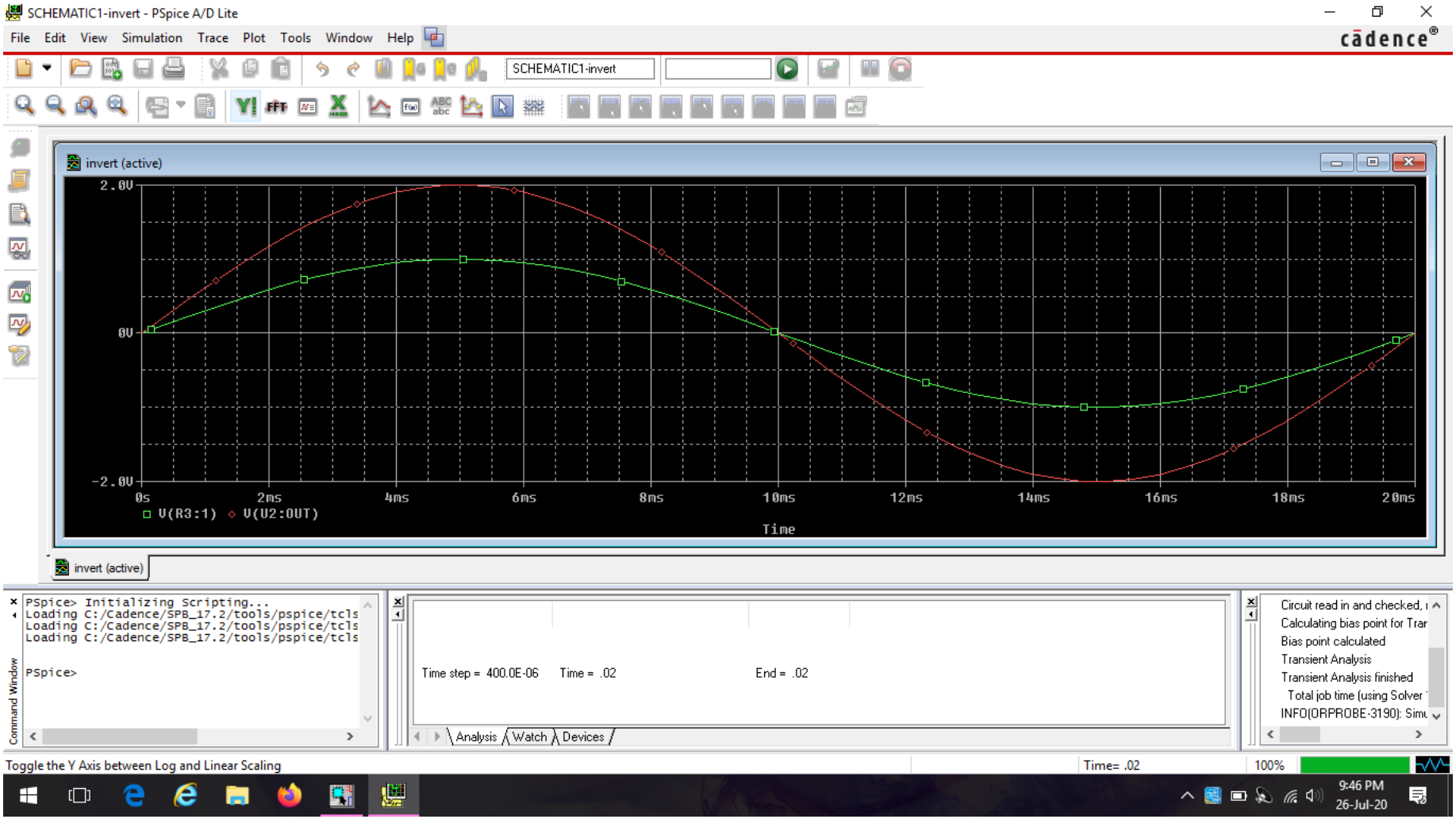
Simulation diagram:-



Graph:-



(INVERTING AMPLIFIER)



(NON INVERTING AMPLIFIER)

Result → The output of inverting amplifier has a phase shift of 180° with no increase in amplitude while of non-inverting has a phase shift of 0° with an increase of amplitude of R_2/R_1.

Inference → If $R_2 = 0$ in non-inverting it becomes voltage follower, i.e, amplitude increase is 0.