Question 01.

Answer the following question for the Triangular wave generator.

Given, $V_L = -V_H$


Integrator   **Non-Inverting Schmitt Trigger**
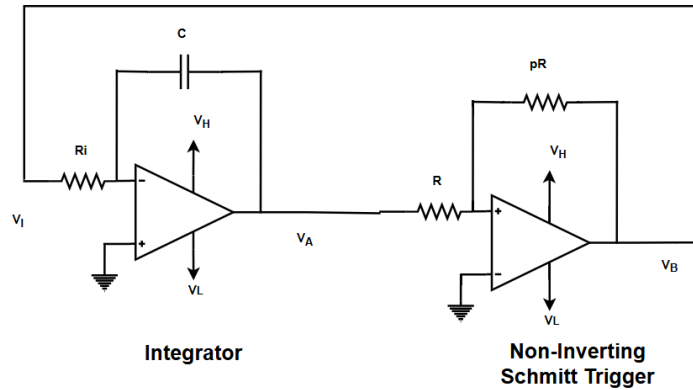
(a)	Prove that the frequency of the triangular wave, $f = \dfrac{P}{4R_iC}$.
(b)	Find the duty cycle of the triangular wave and find the duty cycle of the square wave. Is there any relation between these two duty cycles?
(c)	Draw the wave form of the square wave (V_A) and triangular wave (V_B).

Question 02.

Answer the following question for the Triangular wave generator.

Given, $R_i = 10k$, $C = 10\ \mu F$, $R_2 = pR = 20k$, $R1 = R = 10k$, $V_L = -V_H$ or $V_H = 15$ V, $V_L = -15$ V

Integrator   **Non-Inverting Schmitt Trigger**
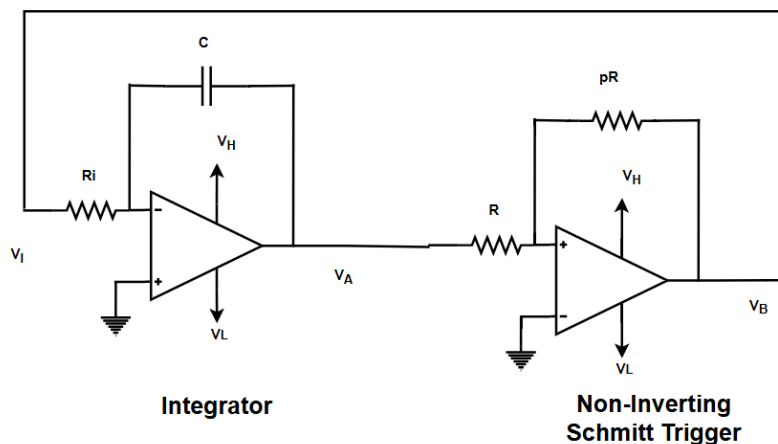
(a)	Find the value of upper threshold and lower threshold value of the Schmitt trigger used in the above triangular wave generator.
(b)	Draw the VTC of the Schmitt trigger used in the above triangular wave generator.
(c)	What is the frequency and time period of the triangular wave generator?

Question 03

Suppose you want to design a triangular wave generator circuit. Required frequency of the wave is 1 kHz.

Duty cycle should be close to 50 %. You have +15V, -15 V power supply, 0.47 μF capacitor and different resistors.

(a)	Find the time period, rising time and falling time of the desired triangular wave.
(b)	Design a circuit to generate the required wave.
(c)	Suppose you have replaced the power supply of your designed circuit with +5V and -5V what will be new frequency and duty cycle of the triangular wave?

Question 04.

Answer the following question for the Triangular wave generator.

Given, $R_i = 10k$, $C = 10\ \mu F$, $R_2 = pR = 20k$, $R1 = R = 10k$, or $V_H = 10$ V, $V_L = -8$ V

Integrator   Non-Inverting
Schmitt Trigger
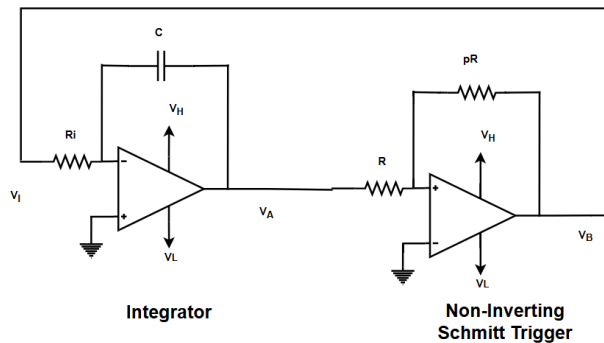
(a)	Find the values of $V_{TH}, V_{TL}, Falling\ time\ and\ Rising\ Time$ of the triangular wave generator.
(b)	What will be the duty cycle of the triangular wave and the square wave?