

Exp- 05 RC PHASE SHIFT OSCILLATOR

OBJECTIVE:

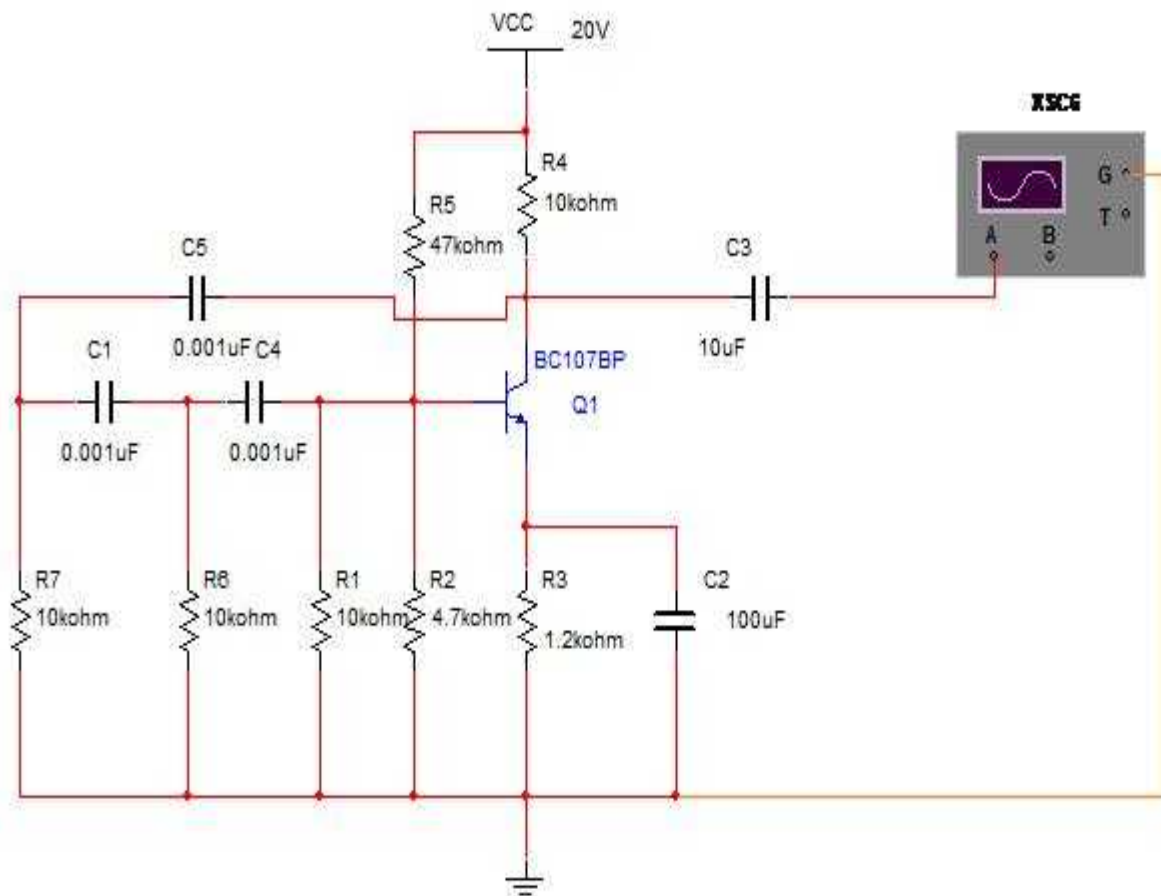
To calculate the frequency of oscillations of RC phase shift oscillator & to compare theoretical and practical value.

Objective:

APPARATUS:

MULTISIM 2001 SOFTWARE PC

CIRCUIT DIAGRAM:



THEORY:

RC-Phase shift Oscillator has a CE amplifier followed by three sections of RC phase shift feedback Networks. The output of the last stage is returned to the input of the amplifier. The values of R and C are chosen such that the phase shift of each RC section is 60°. Thus The RC ladder network produces a total phase shift of 180° between its input and output voltage for the given frequencies. Since CE Amplifier produces 180 ° phase shift, the total phase shift from the base of the transistor around the circuit and back to the base will be exactly 360° or 0°. This satisfies the Barkhausen condition for sustaining oscillations. Total loop gain of this circuit is greater than or equal to 1, this condition used to generate the sinusoidal oscillations.

The frequency of oscillations of RC-Phase Shift Oscillator is,

$$f = 1/2\pi RC\sqrt{6}$$

PROCEDURE:

1. Start MULTISIM. A blank circuit window will appear on the screen along with a component tool bar.
2. Using component tool bar place all the components on the circuit window and wire the circuit.
3. Observe the output signal and note down the output amplitude and time period (T_d).
4. Calculate the frequency of oscillations theoretically and verify it practically ($f=1/T_d$).
5. Repeat the above procedure for different values of R & C.

THEORITICAL CALCULATIONS:

$$R = 10K$$

$$(6+4k) \text{ where } k = R_c/R$$

PRACTICAL CALCULATIONS:

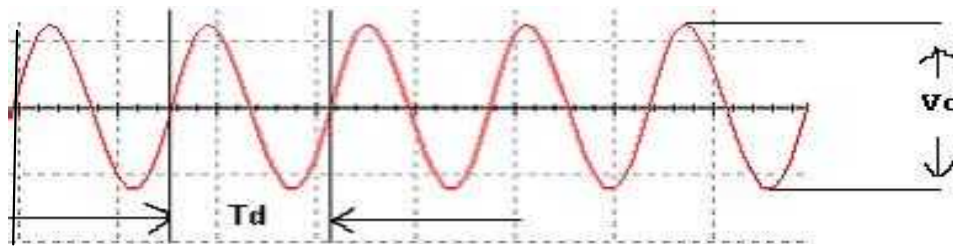
T_d = time period of oscillations

$$f = 1/T_d$$

Tabular column:

Resistance)	Theoretical frequency (KHz)	Practical frequency (KHz)
10k 1k 15k 22k		

MODEL WAVE FORMS:
OUT PUT WAVE FORM :



RESULT: The frequency of oscillations of RC phase shift oscillator is calculated compared the theoretical and practical values.