

EXPERIMENT- 2

Objective: To study the two stage RC coupled amplifier.

Resources Required: Transistor, Resistance , Regulated Power supply, Capacitor, Signal Generator, CRO, Breadboard and Wires, CRO Probes

Theory:

A Resistance Capacitance (RC) Coupled Amplifier is basically a multi-stage amplifier circuit extensively used in electronic circuits. Here the individual stages of the amplifier are connected together using a resistor–capacitor combination due to which it bears its name as RC Coupled.

A two-stage amplifier whose individual stages are nothing but the common emitter amplifiers. Hence the design of individual stages of the RC coupled amplifiers is similar to that in the case of common emitter amplifiers in which the resistors R_1 and R_2 form the biasing network while the emitter resistor R_E form the stabilization network. Here the C_E is also called bypass capacitor which passes only AC while restricting DC, which causes only DC voltage to drop across R_E while the entire AC voltage will be coupled to the next stage. Further, the coupling capacitor C_C also increases the stability of the network as it blocks the DC while offers a low resistance path to the AC signals, thereby preventing the DC bias conditions of one stage affecting the other. In addition, in this circuit, the voltage drop across the collector- emitter terminal is chosen to be 50% of the supply voltage V_{CC} in order to ensure appropriate biasing point.

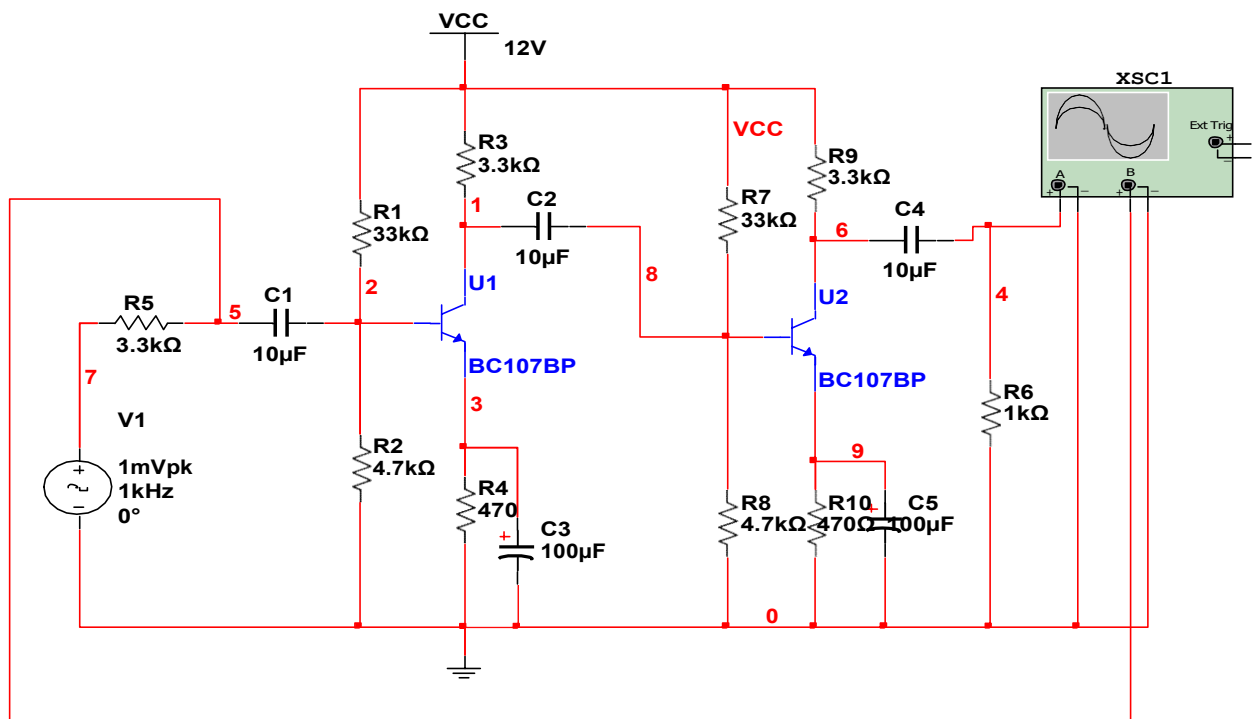


Fig 1 : R-C Coupled Amplifier Circuit

PROCEDURE:

1. Connect the circuit as shown in the figure.

2. A 10V supply is given to the circuit and a certain amplitude of input signal is kept constant using signal generator.
3. Measure the output voltage (say V_{o2}) and also output voltage at the output of 1st stage (say V_{o1}) from CRO.
4. Calculate total voltage gain and also individual voltage gain.
5. Now, by varying the input frequency note the output voltages from CRO and calculate the gain.
6. Calculate overall gain by multiplying gain of individual stage.

OBSERVATION TABLE:

S.No	Frequency(hz)	Output voltage(vo)	Voltage gain (v_o/v_i)	Gain (db) $A_{vf}=20 \log (v_o/v_i)$.

Model Graph

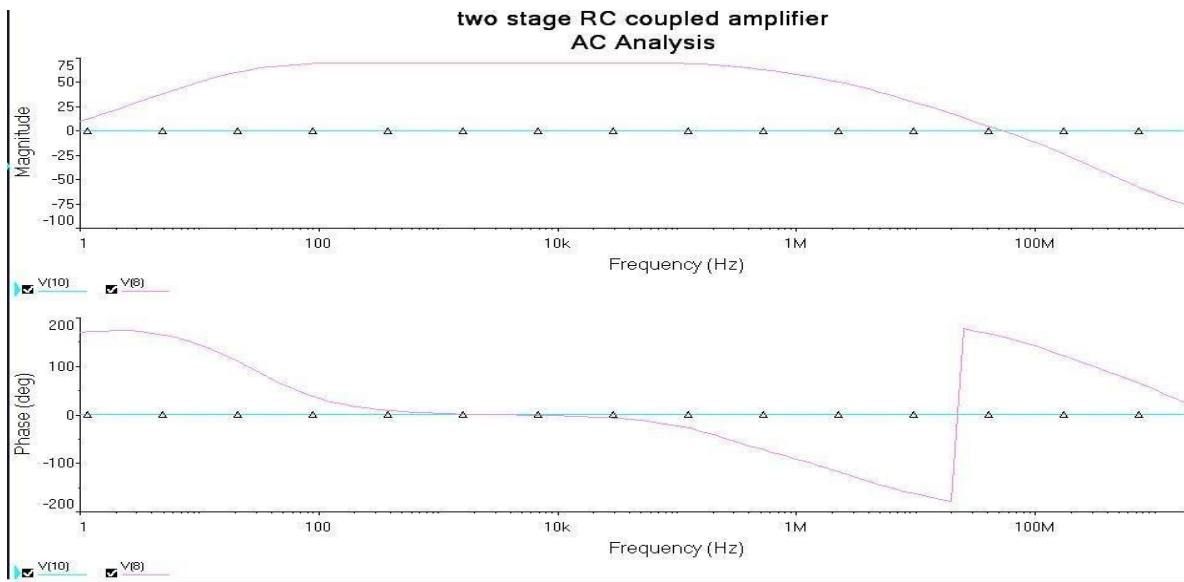


Fig 2: Frequency Response

Result:

The maximum gain is _____ dB and bandwidth is _____ Hz of the CE Amplifier.