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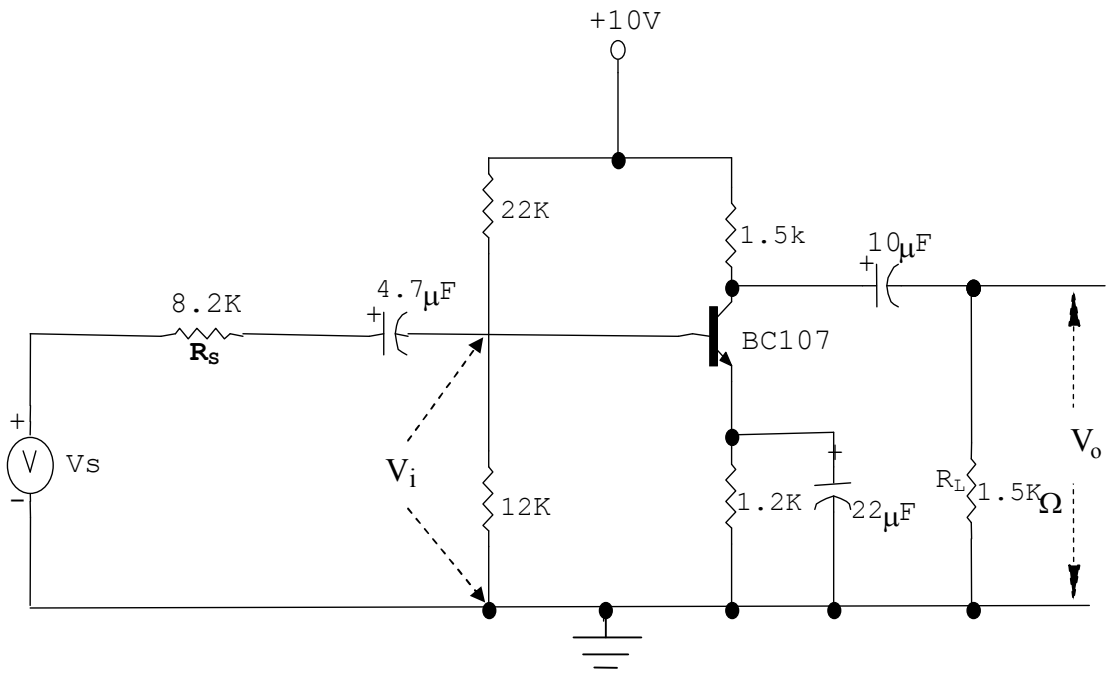
FEED BACK AMPLIFER (CURRENT SERIES)

AIM: To determine the following Bandwidth, Input &Output impedances, voltage gain, current gain and power gain of the Voltage Series Feedback Amplifier.

APPARATUS :

S.No.	Name of the Apparatus	Range	Quantity
1.	CL100	-	2No.
2.	Power Supply	0-30V	1No.
3.	Resistors (Ω)	22K, 12K 8.2K & 1.2K, 1.5K	Each 1No.
4.	Capacitor	10μF& 4.7μF	Each 1No.
5.	CRO	-	1No.

CIRCUIT DIAGRAM:



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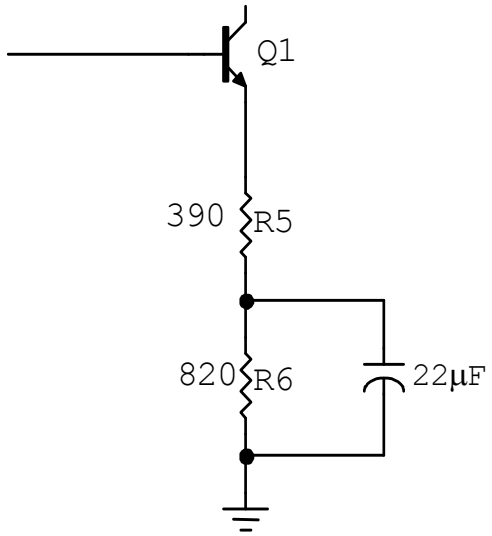
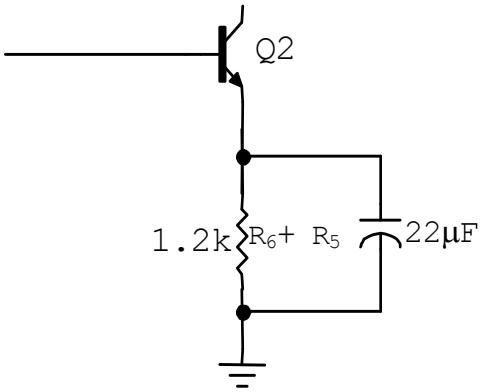
Connection for With feedback



Connection for Without feedback



PROCEDURE:

1. Connect the circuit as shown in figure without feedback network.
2. Apply the biasing voltage of 7V.
3. Adjust the Signal generator voltage so as to get V_i =15mV and measure $V_{s.}$
4. Vary the frequency of the signal generator from 100Hz to 1MHz, in steps and note down corresponding output voltage.
5. In the mid band range remove R_L and note down the output which is V_{NL}.
6. Connect the circuit as shown in figure with feedback network
7. Repeat the steps 2 to 5
8. Plot the frequency response and determine the bandwidth.
9. Calculate the input and output impedance in the mid band region using

WITH FEEDBACK

$$R_i = \frac{ViR_S}{V_S - V_I} =$$

$$R_O = \frac{V_{NL} - V_{FL}}{V_{FL}} \times R_L =$$

WITHOUT FEEDBACK

$$R_i = \frac{V_i R_S}{V_S - V_I} =$$

$$R_O = \frac{V_{NL} - V_{FL}}{V_{FL}} \times R_L =$$

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8. Calculate the current gain A_I, voltage gain A_V and power gain(A_P) using

WITH FEEDBACK

$$A_I = \frac{I_O}{I_i} =$$

$$I_O = \frac{V_O}{R_O} =$$

$$A_V = \frac{V_O}{V_i} =$$

$$I_i = \frac{V_s - V_i}{R_s} =$$

Power gain(A_P)= A_V. A_I =

WITHOUT FEEDBACK

$$A_I = \frac{I_O}{I_i} =$$

$$I_O = \frac{V_O}{R_O} =$$

$$A_V = \frac{V_O}{V_i} =$$

$$I_i = \frac{V_s - V_i}{R_s} =$$

Power gain(A_P)= A_V. A_I =

TABULATION:

	WITHOUT FEEDBACK				**WITH FEEDBACK**			
	V_S=		**V_{NL}=**		**V_S=**		**V_{NL}=**	
Frequency (Hz)	**V_i**(mV)	**V_o**(V)	$Av = \frac{V_o}{V_i}$	**20 log A_V**	**V_i** (mV)	**V_o** (V)	$Av = \frac{V_o}{V_i}$	**20 log A_V**

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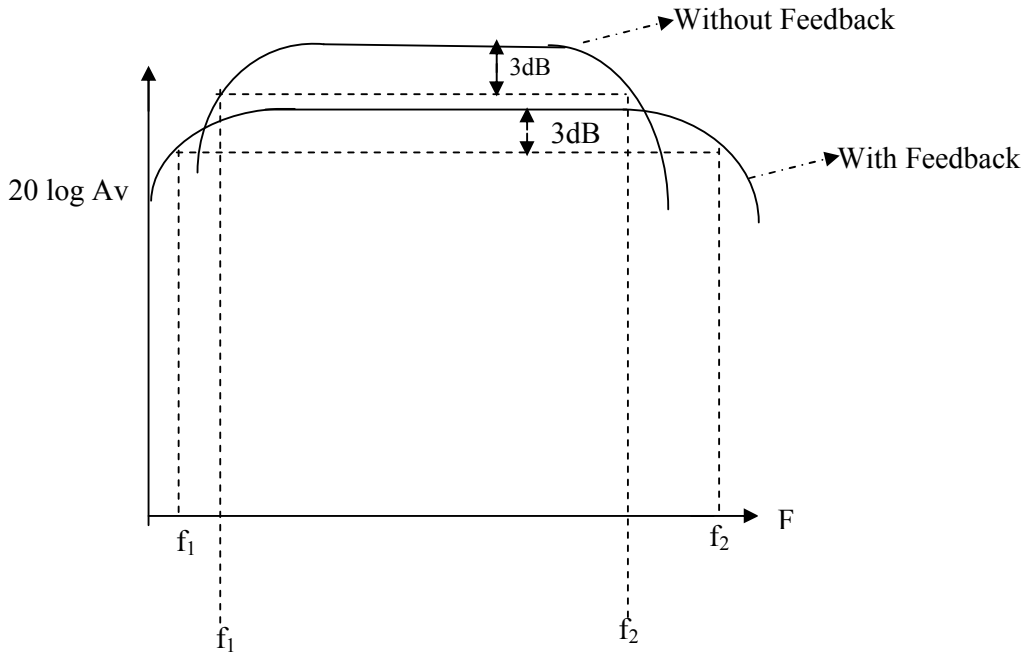
Frequency (Hz)	V_i(mV)	V_o(V)	$Av = \frac{V_o}{V_i}$	**20 log A_V**	V_i (mV)	V_o (V)	$Av = \frac{V_o}{V_i}$	**20 log A_V**

MODEL GRAPH:



Bandwidth(Without Feedback)

$f_2 - f_1$ =

Bandwidth(Without Feedback)

$f_2 - f_1$ =

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RESULTS:

WITH FEEDBACK		WITHOUT FEEDBACK	
Input impedance(R_i)	=	Input impedance(R_i)	=
Current gain(A_i)	=	Current gain(A_i)	=
Output impedance(R_o)	=	Output impedance(R_o)	=
Voltage gain(A_v)	=	Voltage gain(A_v)	=
Power gain(A_P)	=	Power gain(A_P)	=
Bandwidth	=	Bandwidth	=