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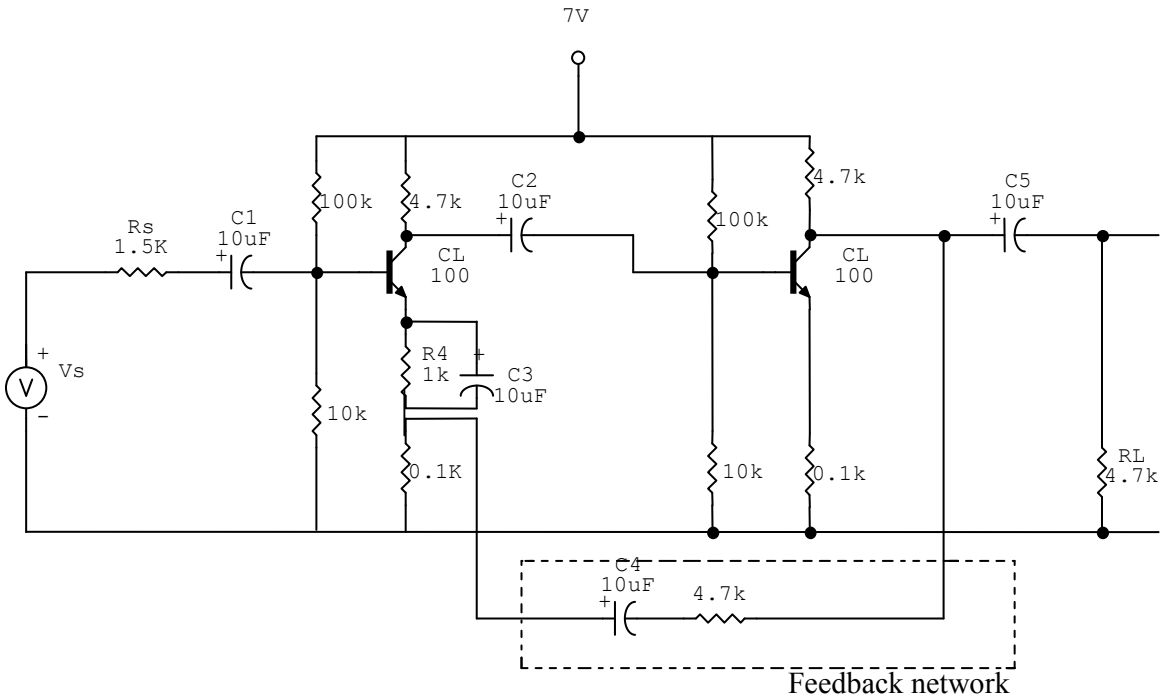
FEEDBACK AMPLIFIER (VOLTAGE SERIES)

AIM: To determine 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)	100K, 10K, 4.7K	Each 2No.
		4.7K, 1K, 1.5K, 100	Each 1No.
4.	Capacitor	4.7μF,	3No.
		10μF	
5.	CRO	-	1No.

CIRCUIT DIAGRAM:



PROCEDURE:

1. Connect the circuit as shown in figure without feedback network.

2. Apply the biasing voltage of 7V.

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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

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

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

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

WITH FEEDBACK

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

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

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

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

WITHOUT FEEDBACK

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

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

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

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

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Power gain(A_P)= A_V. A_I = **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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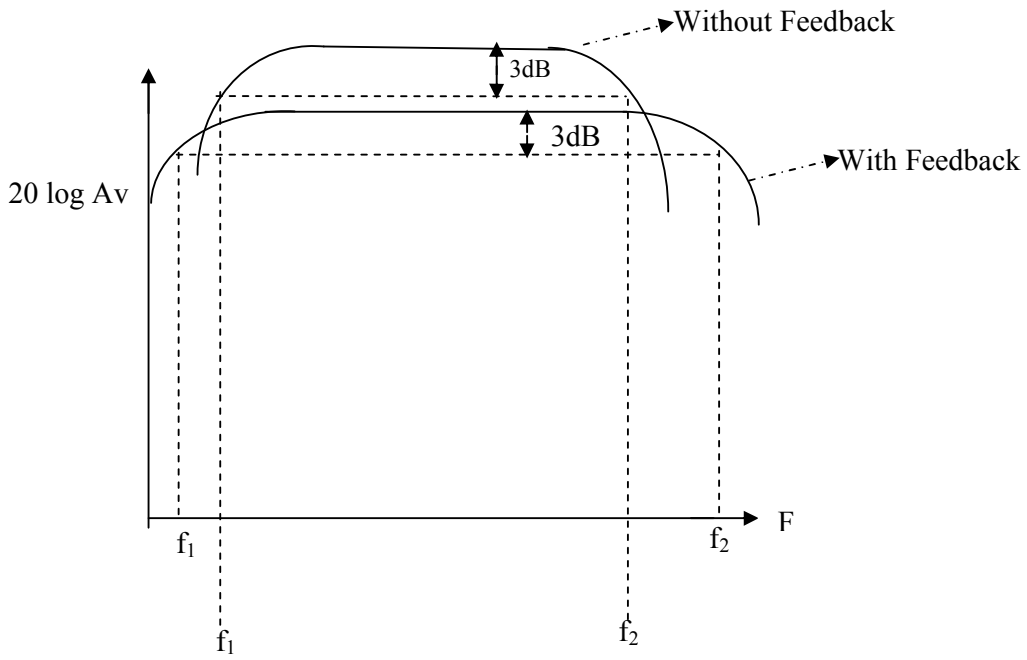
MODEL GRAPH:



Bandwidth(Without Feedback**)**

$f_2 - f_1$ =

Bandwidth(Without Feedback**)**

$f_2 - f_1$ =

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	=