

Assignment 2

Feedback

Question 1:— Compare Positive and negative feedback.

Question 2:— List five characteristics of an amplifier, which are modified by negative feedback. And explain how the negative feedback can be used for input resistance, output resistance and bandwidth stability.

Question 3:— With negative feedback mathematically explain stabilization of gain (Desensitivity of transfer function), effect on non linear distortion, effect on noise and effect on frequency distortion and bandwidth.

Question 4:— Obtain an expression for the output resistance of an amplifier with current shunt (shunt series) and Voltage shunt feedback by including resistance R_L (load resistance)

Question 5:— An amplifier with open loop gain $A = 2000 \pm 150$ is available. It is necessary to have an amplifier whose gain varies not more than $\pm 0.2\%$. Calculate A_f and β .

Question 6:— If an amplifier has a bandwidth of 220 kHz and a voltage gain of 100, what will be the new bandwidth and gain if 5% negative feedback is introduced? What is the product of gain and bandwidth before and after adding negative feedback? What should be the amount of feedback if the bandwidth is restricted to 1 MHz.

Question 7:— Determine the voltage gain, input and output resistance with feedback for voltage series feedback having $A = -100$, $R_i = 10\text{K}\Omega$, $R_o = 20\text{K}\Omega$ for feedback of (a) $\beta = -0.1$ and (b) $\beta = -0.5$

Question 8:— In a single stage amplifier, voltage gain without feedback is 80, input resistance $R_i = 800\text{ ohm}$ and output resistance is 8Kohm . If the 20% output voltage is feedback in series with input, determine A_f , R_{if} and R_{of} of the negative feedback amplifier.

Question 9:— A RC coupled amplifier has a midfrequency gain of 400 and lower and upper 3 dB frequencies of 100 Hz and 15 KHz. A negative feedback with $\beta = 0.001$ introduced in the amplifier circuit. Calculate gain with feedback and New bandwidth.

Question 10:— For an amplifier If $A = 1000$, $f_l = 50\text{ Hz}$, $f_h = 200\text{ KHz}$ and a distortion of 5% without feedback. With negative feedback $\beta = 0.01$. Find the amplifier A_f , new (f_l') and new (f_h') .