NANYANG TECHNOLOGICAL UNIVERSITY SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING

ACADEMIC YEAR 2020-2021
SEMESTER 2

EE3019 INTEGRATED ELECTRONICS

TUTORIAL 6

---

1. Figure **6**.1 shows a non-inverting buffer op-amp configuration. Assuming that the op-amp has A = 10, infinite input resistance and zero output resistance, what is β? What is the closed-loop voltage gain? What is the amount of feedback in dB? For v_S = 1 V, find v_o, and V_i. If A decreases by 10%, what is the corresponding decrease in A_f?

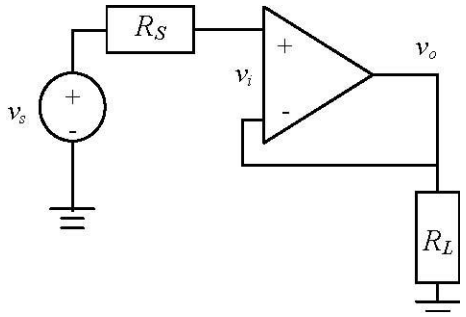
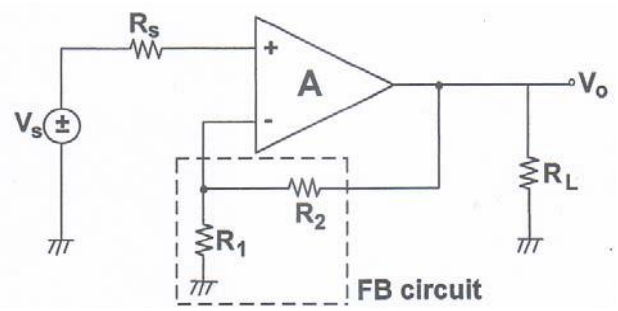


Figure **6**.1

2. An amplifier has an open loop gain of 5000 ± 500 V/V, and a dominant pole at 4 kHz. If the amplifier is used in the design of a feedback amplifier with a gain variation of no more than ± 1%, find the feedback factor of the feedback network used, the closed-loop gain, and the bandwidth of the feedback amplifier.

[Answer: 1.8×10^{-3}, 500, 40 kHz]

3. Figure **6**.2 shows a non-inverting op-amp. If the open loop voltage gain $A = 10^5$, find the ratio of R_2/R_1 to obtain a closed-loop voltage gain of 100. If there is a 15% change in the value of A, find the corresponding change in the closed-loop gain.



[Answer: 99, 0.015%]

Figure **6**.2