Laboratory #4 Report

Class:

Name: Student ID:

1. Open-loop Frequency Response

V2= V, V3= V and Vo= V.

Table 4.2

|  |  |  |  |
| --- | --- | --- | --- |
| fin(Hz) | Vi,pp(V) | Vo,pp(V) | Ao = (dB) |
| 20k |  |  |  |
| 40k |  |  |  |
| 60k |  |  |  |
| 80k |  |  |  |
| 100k |  |  |  |
| 200k |  |  |  |
| 500k |  |  |  |

1. Closed-loop Frequency Response ($β=\frac{1}{2}$)

V2= V, V3= V and Vo= V.

Table 4.3

|  |  |  |  |
| --- | --- | --- | --- |
| fin(Hz) | Vi,pp(V) | Vo,pp(V) | Af = (dB) |
| 10k |  |  |  |
| 20k |  |  |  |
| 100k |  |  |  |
| 200k |  |  |  |
| 500k |  |  |  |
| 1M |  |  |  |
| 10M |  |  |  |

1. Closed-loop Frequency Response ()

V2= V, V3= V and Vo= V.

Table 4.4

|  |  |  |  |
| --- | --- | --- | --- |
| fin(Hz) | Vi,pp(V) | Vo,pp(V) | Af = (dB) |
| 1k |  |  |  |
| 5k |  |  |  |
| 10k |  |  |  |
| 20k |  |  |  |
| 100k |  |  |  |
| 200k |  |  |  |
| 500k |  |  |  |
| 1M |  |  |  |
| 10M |  |  |  |

1. Problem 1

Use MATLAB or Excel to plot the open-loop Bode plot according to Table 4.2 and the closed-loop Bode plot according to Table 4.3 and Table 4.4.

1. Problem 2

Compare the two Bode plots which have different values. What are the differences? If a larger feedback ratio (e.g. =) is used, try to predict what will happen on OPAMP output node?

1. Bonus

In Exp.1, why can’t we measure the open-loop gain directly? Try to explain your opinion. (Hint: you may need your pre-lab work.)

1. Conclusion