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Introduction

The report for lab 7 i.e., Diodes took place on 24 March 2021.Appendix at the end is the prelab Assignment.

Objective

The main goal of this lab is to analyze the characteristics of the common emitter amplifier and learn the experimental procedures to observe the input and output impedance of an amplifier.

Circuit under Test

The circuit in figure below is a common emitter amplifier circuit. Vcc = 15V,R1 = 12kΩ, R2 = 15kΩ, Re = 6.8kΩ, Re2 = 220Ω.

Diagram, schematic

Description automatically generated

Experimental Result

E1. Quiescent parameters of ce amp of and two stage amp of fig

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Amplifier | Jumpers | Vc | Ve | Ic | Ve2 | Ic2 |
| CE | NA | 12.564 | 7.656 | 1.564 | NA | NA |
| Two stage | K-L | 12.246 | 7.652 | 1.587 | 11.264 | 9.756 |

E2(a). No load AC voltage and gain of the CE amplifier of figure

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Amplifier | Jumpers | Vi | Vc | Ve2 | Vo | Avo |
| CE | NA | 0.0726 | 0.7654 | NA | NA | -11.345 |

E2(b). Loaded AC voltage and gain of the CE amplifier of figure.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Amplifier | Jumpers | Vi | Vc | Ve2 | Vo | Avo |
| CE | K-N | 0.0749 | 0.0465 | NA | 0.04596 | -0.698 |

E3(a). No load AC voltage and gain of the two-stage amplifier of figure.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Amplifier | Jumpers | Vi | Vc | Ve2 | Vo | Avo |
| CE | K-L | 0.0735 | 0.796 | 0.785 | NA | -11.246 |

E3(b). Loaded AC voltage and gain of the two-stage amplifier of figure.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Amplifier | Jumpers | Vi | Vc | Ve2 | Vo | Avo |
| CE | K-L, M-N | 0.0701 | 0.6725 | 0.659 | 0.6417 | -10.48 |

Graph E3 both the waves are sine waves.

Conclusion Remark

C3. As the voltage gain of CC amplifier is equal to gm(RE3//RL)/(1+gm((RE3//RL)),and gm is much larger .this means the gain is not affected by Rl that Av or Avo barely changes.

Av = -0.62v/v

Avo = -17 v/v

There fore the voltage gain doesn’t affect when load resistance is added Rl = 180Ω.

Appendix: prelab-Assignment

P1.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Vc | Ve | Ic | Avo | Av | Avs | Ro |
| 11.08 | 11.01 | 1.005mA | -17 | -0.62 | 0.623 | 3.9kΩ |

Table p1(a).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Vc[v] | Ve[v] | Ic[mA] | Ve2[v] | Ic2[mA] | Avo[v/v] | Av[v/v] | Avs[v/v] | Ro[KΩ] |
| 10.24 | 3.91 | 1.005 | 3.25 | 14.9 | -17 | -0.62 | -0.623 | 3.9 |

Table p1(b).