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***Electronics and Communications Department***

***Analog Electronics***

**Lab 5**

**Differential Amplifier**

|  |  |
| --- | --- |
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| **Section** | **4** |
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* **Part I (DC measurements)**
* from the circuit shown in the figure.

Diagram, schematic

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* we get the DC measurements as shown in the table below.

-Assume =26mV

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | β | = | = |
| 0.688mA | 0.69mA | 2.27µA | 303 | 37.6Ω | 26.4mA/V |

* **Part II (AC)**
* The circuit after connecting 2 AC sources.

Diagram, schematic

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= =11.45 KΩ ,=108.16 Ω

= = -9.24 V/V , = = -0.05 V/V

CMRR== 184.8 = 45.3 dB

* Now we will see the three modes of the Differential Amplifier:

-Assume V1 at 200mV in the three cases.

1. Double input mode by putting V2 at 100mV.

Graphical user interface

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We get = 575mV , = 550mV

1. Single input mode by deleting V2 source and connecting R2 to the ground.

Graphical user interface

Description automatically generated

We get = 700mV , = 675mV

1. Common input mode by connecting R2 to V1 (the same source for 2 input).

A screenshot of a computer

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We get = 12mV , = 12mV

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | = |
| 200mV | 100mV | 575mV | 550mV | =11.25 |
| 200mV | 0 | 700mV | 675mV | =6.875 |
| 200mV | 200mV | 0 | 0 | =0 |