

***Faculty of Engineering and Technology***

***Electrical and Computer Engineering Department***

***Electronic lab (ENEE3102)***

**Pre lab of EX #6**

**Multistage Amplifiers and Frequency Response " "**

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**Sec:-1**

***I. Multistage Amplifier Design:***

We want to design a two-stage amplifier with a voltage gain 200 to give a peak-to-peak output of 2.5 v.

Av1 = 100, Av2 = 2, Vi = 12.5 m Vp-p .

To design the first stage of the amplifier for the h-parameters of a transistor are

hie = 4\*Ω

hoe = 1\Ω

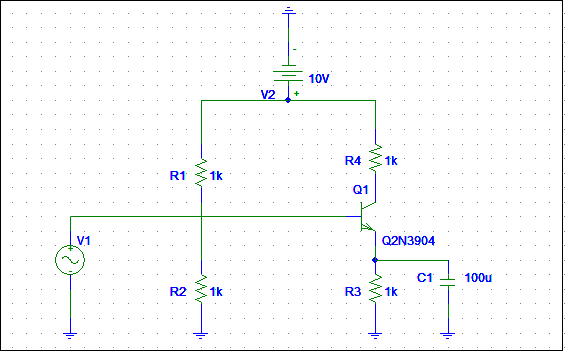
hfe = 300

hre = 10-3

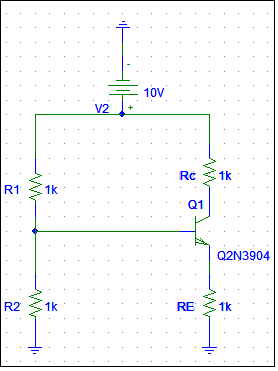
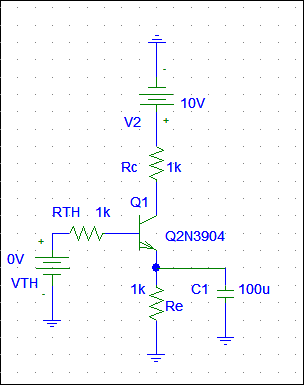
Vcc = 10v

The capacitor = 100uF in parallel with .

* design the first stage:(before not found values of resistors)



Dc analysis



=

IE=(hfe+1)IB =(300+1)6.4\*

Ic=

IC=IE

Let VE=0.1 vcc VE=0.1\*10=1V

=

To Find & we need to &

VTH+VBE+RE\*IE+(RTH\ \*IE)=0-

= + ] +

= 1.926 [ + 0.519 ] + 0.7

= 1.8 volt.

= =

= 0.18

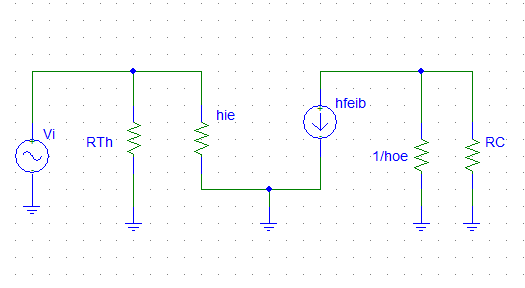
= = 15.57

We make up (1) in (2) and we get:

= 86.5 K

= 18.98 K

Ac analysis (small signal equivalent circuit):



Find RC ??

= - \*\* (//).

=

= = - \*\* (//).

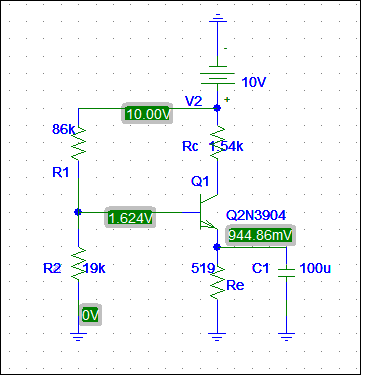
= - \* \* (//) = 100

-300 \* \*// = - 100

// = 1333.33

(\*)/( + = 1333.33

= 1.538 k



Then the same procedure for stage 2:

The values of R1,R3,RE are the same of stage 1 but Rc is different because the gain is 2:

= - \*\* (//).

=

= = - \*\* (//).

= - \* \* (//) = 2

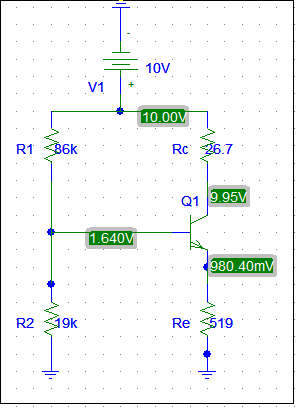
-300 \* \*// = - 2

// = 26.67

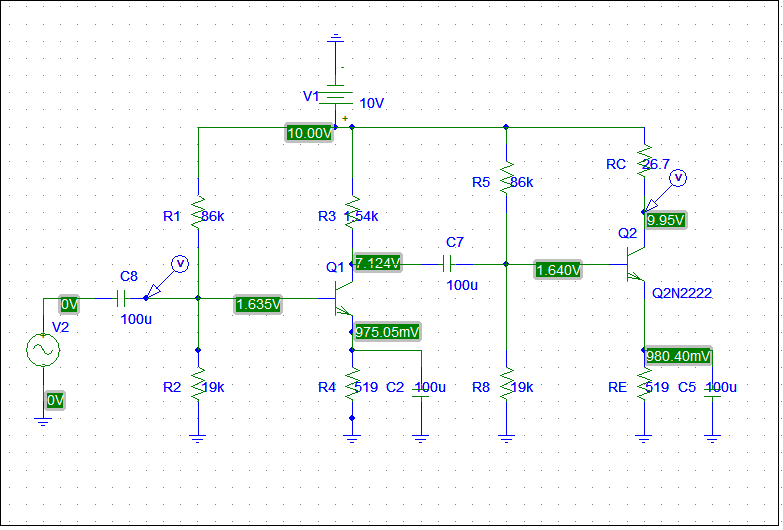
(\*)/( + = 26.67

= 26.74 k

When we setup the designed for stage 2 circuit, the voltages are :



**The two stages together ::**



**Vin show in figure below :**

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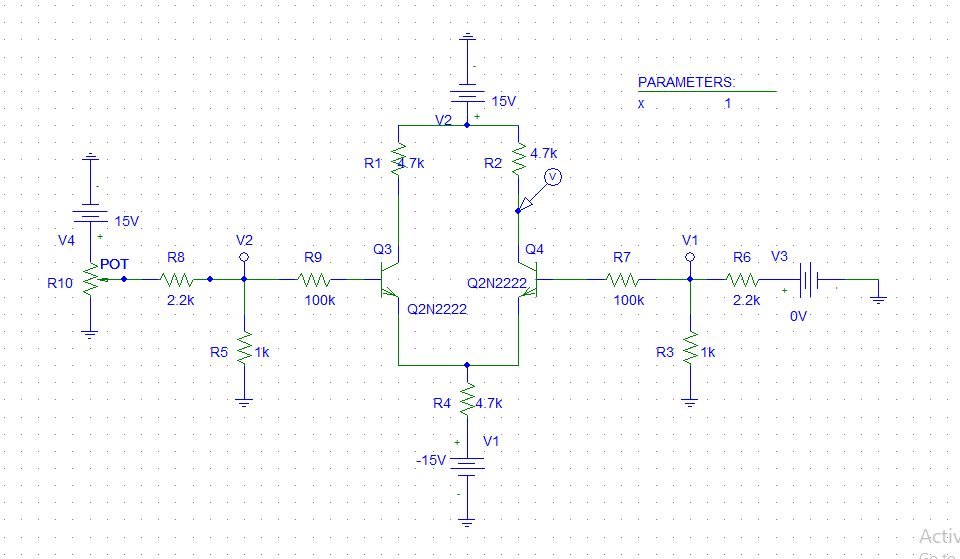
**Vout show in figure below :**

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**show in figure below :**

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**III. DIFFERENTIAL AMPLIFIER**.

1)a

***II. FREQUENCY RESPONSE.***

In lab taken and fill the table data in different frequency