SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A+ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

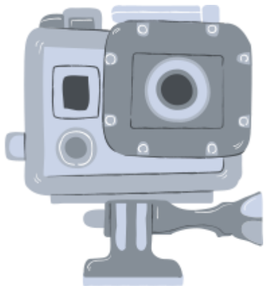
DEPARTMENT OF BIOMEDICAL ENGINEERING

COURSE NAME: 19EIB201/ ELECTRONIC DEVICES

II YEAR / III SEMESTER

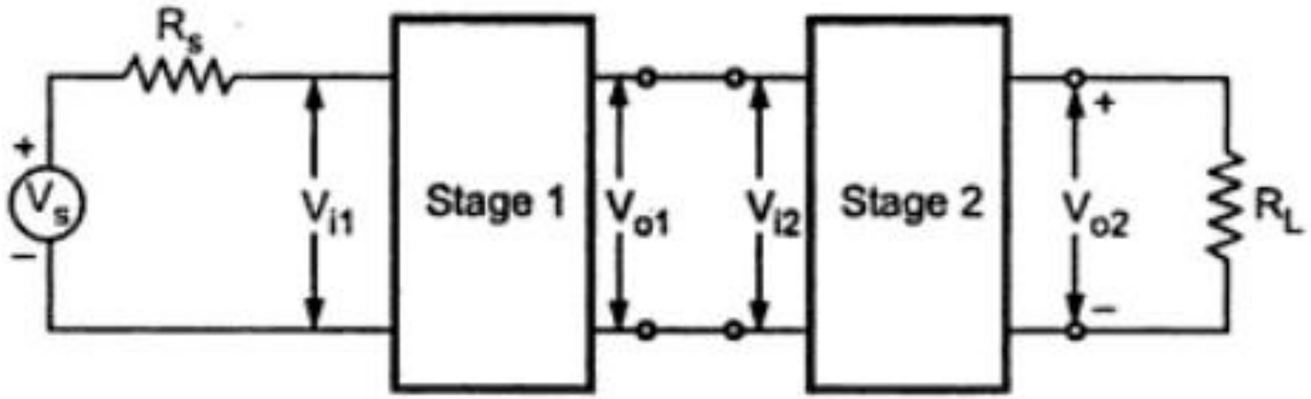
Unit 3– Small Signal Amplifier

Topic 2: Cascade Amplifier



Cascade Amplifier

- In practice, we need amplifier which can amplify a signal from a very weak source such as a microphone, to a level which is suitable for the operation of another transducer such as loudspeaker.
- This is achieved by cascading number of amplifier stages, known as multistage amplifier.



Cascaded amplifier

Need for cascading

- For faithful amplification amplifier should have desired **voltage gain, current gain** and it should match its **input impedance** with the source and **output impedance** with the load.
- Many times these primary requirements of the amplifier can not be achieved with single stage amplifier, because of the limitation of the transistor/FET parameters.
    1. When the amplification of a single stage amplifier is not sufficient.
    2. When the input or output impedance is not of the correct magnitude, for a particular application two or more amplifier stages are connected, in cascade.

Two Stage Cascaded Amplifier

- V_{i1} is the input of the first stage and V_{o2} is the output of second stage.

  So, V_{o2}/V_{i1} is the overall voltage gain of two stage amplifier.

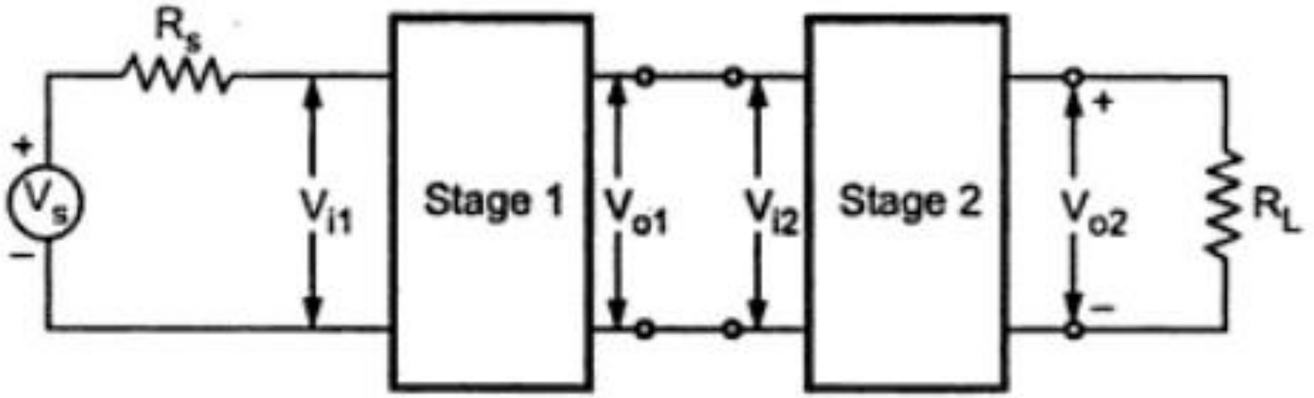
$$A_V = \frac{V_{o2}}{V_{i1}}$$

$$= \frac{V_{o2}}{V_{i2}} \frac{V_{i2}}{V_{i1}}$$

$$V_{o1} = V_{i2}$$

$$\therefore A_V = \frac{V_{o2}}{V_{i2}} \frac{V_{o1}}{V_{i1}}$$

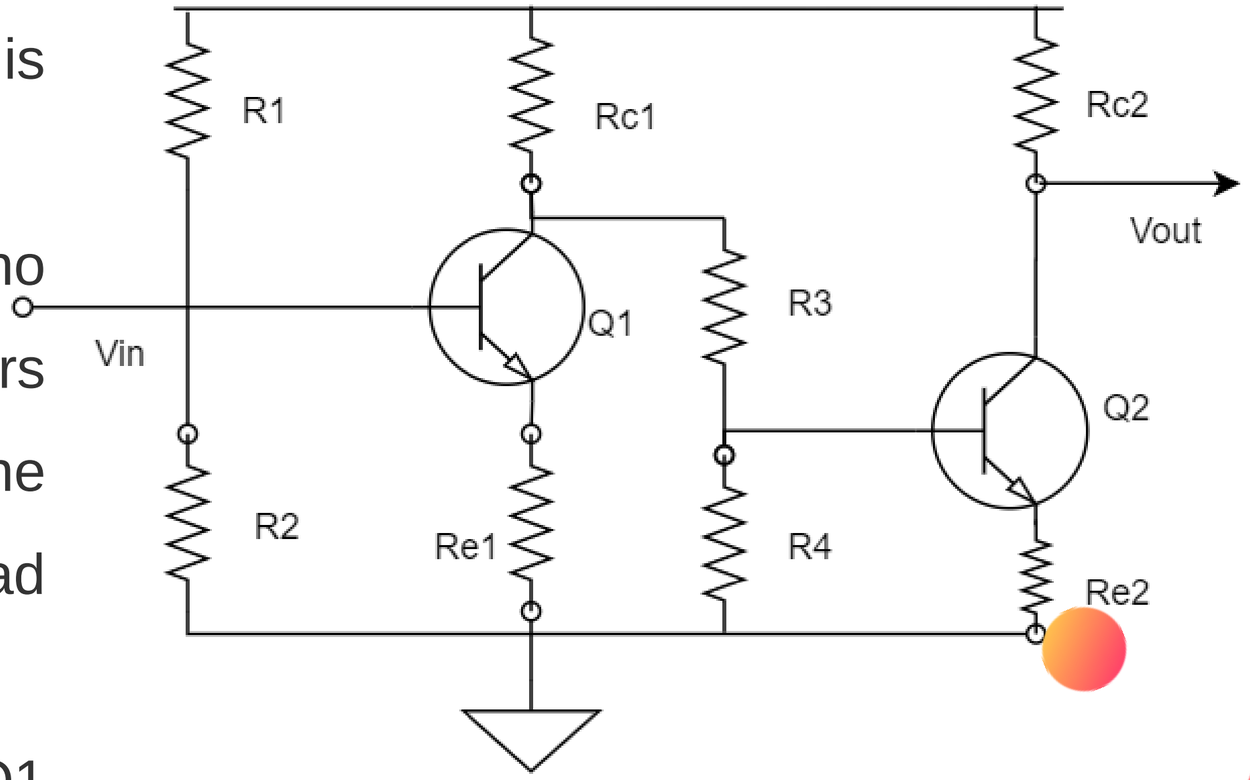
$$= A_{V2} A_{V1}$$



Cascaded amplifier

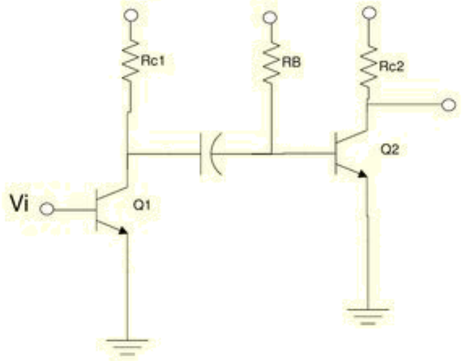
CE/CC Cascading Method

- The CE resistance is correspondingly high whereas the CC (output resistance) is correspondingly low.
- The transistor Q2 stage provides no increase in the gain of the voltage but offers a close minimal resistance output so the gain is almost not dependent on load resistance values.
- While the maximized resistance at the Q1 stage shows that the CE voltage is not dependent on input source resistance

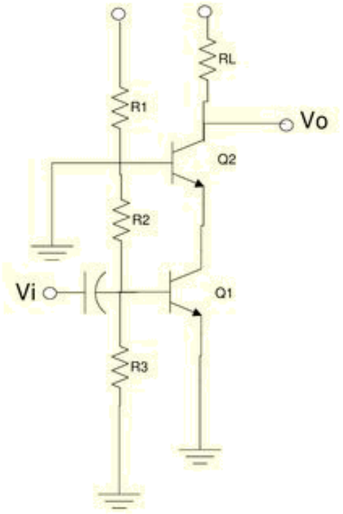


Configurations

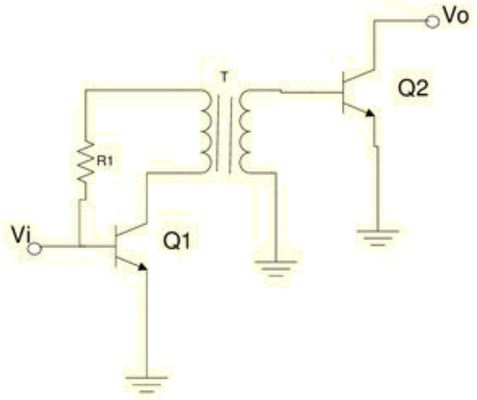
- Multistage amplifier configuration:



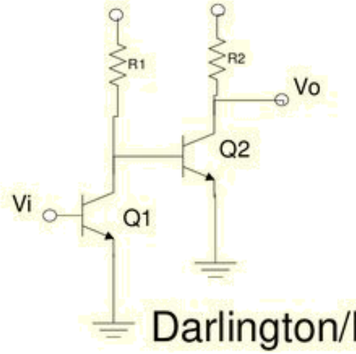
Cascade /RC coupling



Cascode

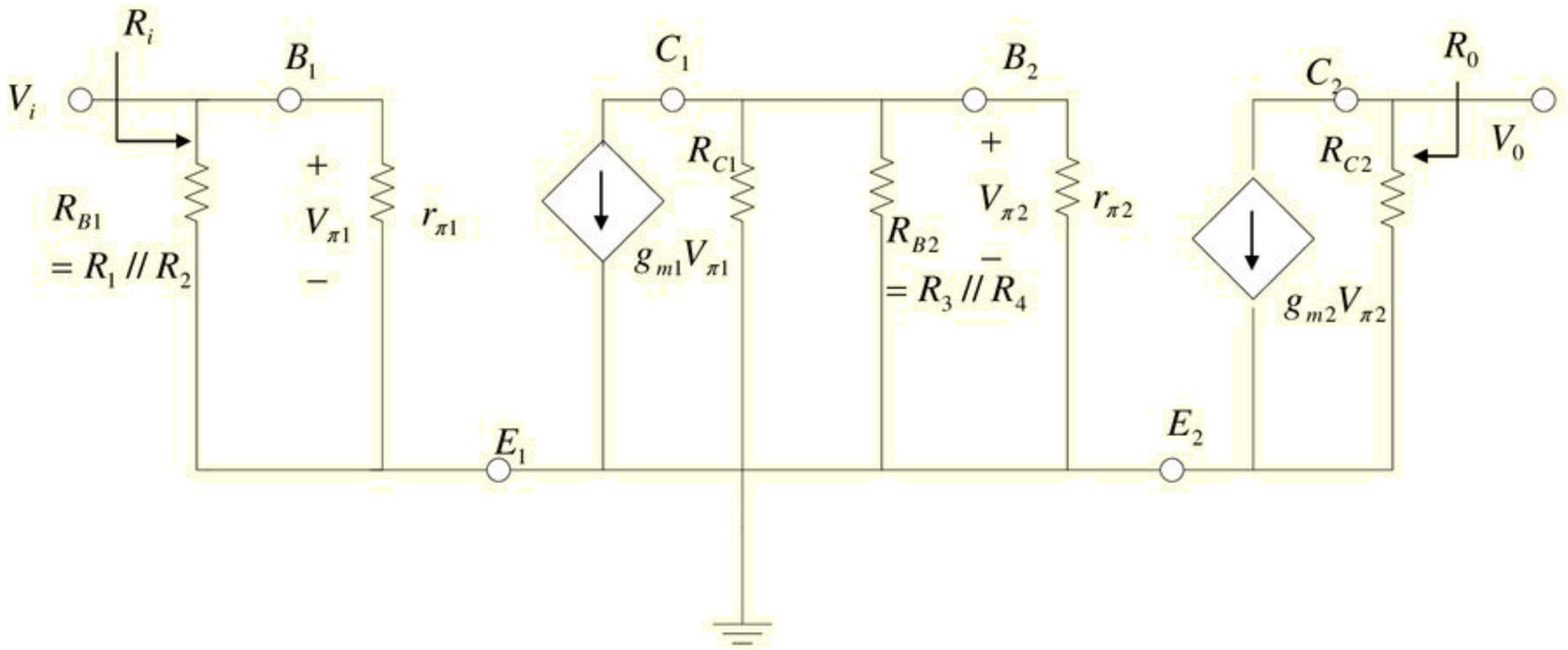


Transformer coupling



Darlington/Direct coupling

AC Equivalent



Ac equivalent circuit for cascade amplifier

SUMMARY

ASSESMENT

Dear student,

Quiz is posted in your Google class room

Allotted time for quiz is 5 min

No of Questions is 10

KEEP
LEARNING..

Thank u

SEE YOU IN NEXT CLASS