Unit -> 1 Diode Circuits

Subject -> Analog Circuits

Faculty -> Dr Nidhi chauhan

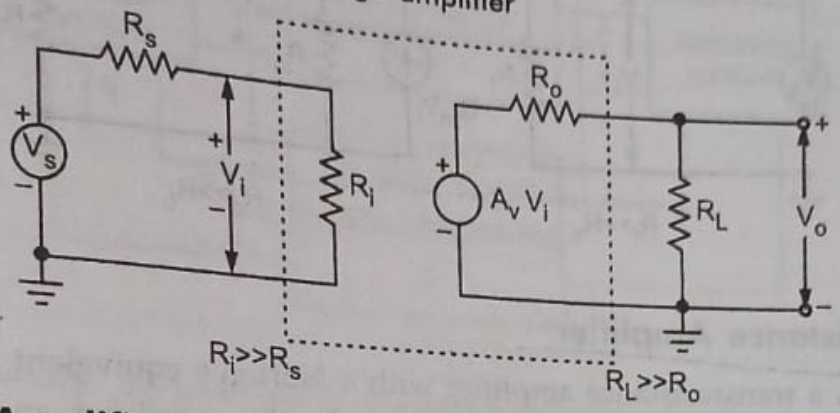
Paper code -> BT 402

Lecture 3 -> Transonductance and transresistance Amp

voltage amplifier. An ideal voltage amplifier must have infinite input resistance R_i and zero output resistance R_o. For practical voltage amplifier we must have $R_i >> R_s$ and $R_L >> R_o$.

▶ **Figure 6.1**

Thevenin's equivalent circuits of a voltage amplifier

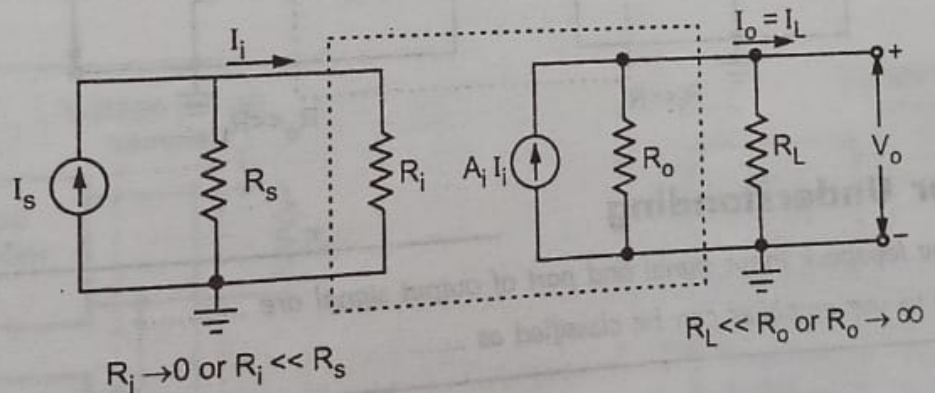


6.2.2 Current Amplifier

Fig. 6.2 shows Norton's equivalent circuit of a current amplifier. If amplifier input resistance $R_i \to 0$, then $I_i \approx I_s$. If amplifier output resistance $R_o \to \infty$, then $I_L = A_i I_i$. Such amplifier provides a current output proportional to the signal current, and the proportionality factor is independent of source and load resistances. This amplifier is called **current amplifier**. An ideal current amplifier must have zero input resistance R_i and infinite output resistance R_o. For practical current amplifier we must have $R_i << R_s$ and $R_o >> R_L$.

▶ **Figure 6.2**

Norton's equivalent circuits of a current amplifier



6.2.3 Transconductance Amplifier

Fig. 6.3 shows a transconductance amplifier with a Thevenin's equivalent in its input circuit and Norton's equivalent in its output circuit. In this amplifier, an output current is proportional to the input signal voltage and the proportionality factor is independent of the magnitudes of the source and load resistances. Ideally, this amplifier must have an infinite input resistance R_i and infinite output resistance R_o. For practical transconductance amplifier we must have $R_i >> R_s$ and $R_o >> R_L$.

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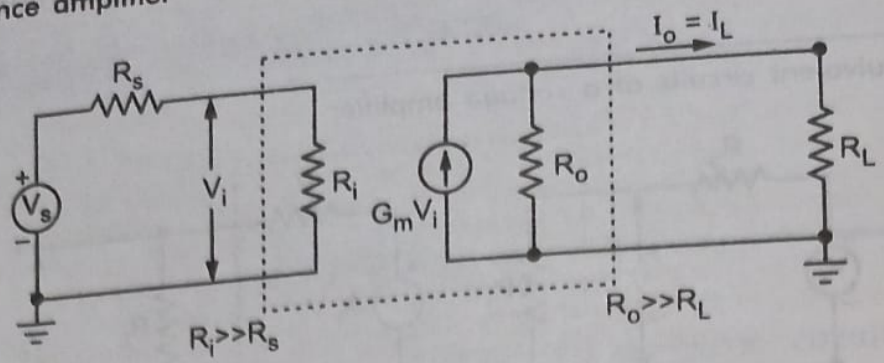
Figure 6.3

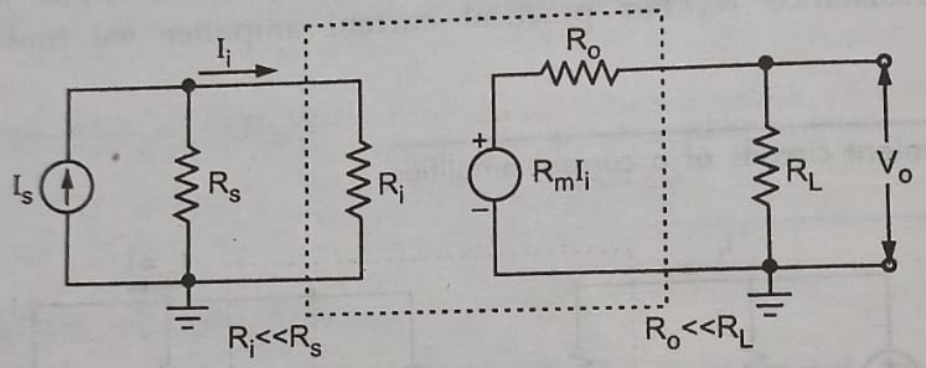
Transconductance amplifier



6.4 Transresistance Amplifier

Fig. 6.4 shows a transresistance amplifier with a Norton's equivalent in its input circuit and a Thevenin's equivalent in its output circuit. In this amplifier an output voltage is proportional to the input signal current and the proportionality factor is independent on the source and load resistances. Ideally, this amplifier must have zero input resistance R_i and zero output resistance R_o. For practical transresistance amplifier we must have $R_i << R_s$ and $R_o << R_L$.

Figure 6.4



Test Your Understanding

1. *In negative feedback input signal and part of output signal are .....*
2. *According to use amplifier can be classified as .....*