SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

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

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

23ECB202 – LINEAR INTEGERATED CIRCUITS

II YEAR/ III SEMESTER

UNIT 1 – **OP AMP CHARACTERISTICS**

TOPIC 1- 6 AC characteristics of Op Amp

AC Characteristics

- Purpose of this circuit is to amplify a small **AC** input signal, such as an audio or radio frequency signal

- A small **AC** voltage is applied to the input, through a coupling capacitor

- Hence, such a circuit is useful only as an **AC amplifier**

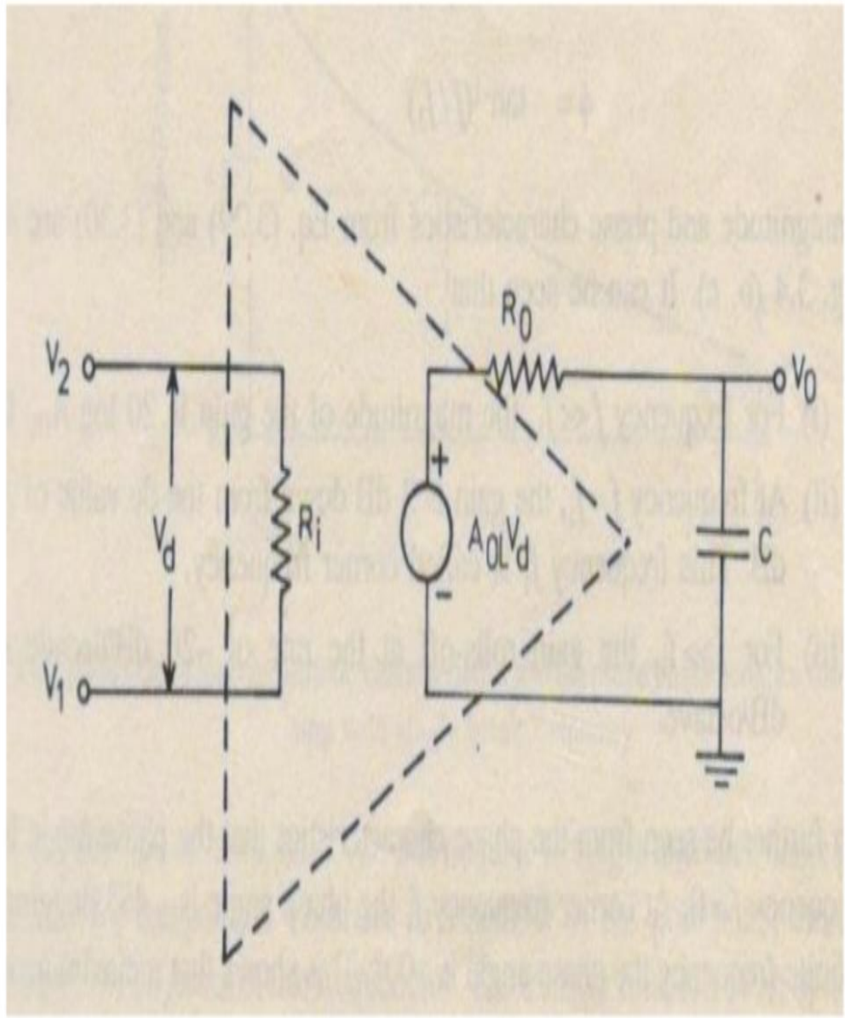
- To amplify DC signals separate operational **amplifier** circuit is used

- For small signal sinusoidal applications the AC characteristics are

    1. Frequency response.
    2. Slew rate

Frequency response

- An ideal op-amp has infinite band width
- Its open loop gain is 90dB with d.c.signal and this gain should remain the same through audio and radio frequency
- But practically op-amp gain decreases at high frequency
- This is due to a capacitive component in the equivalent circuit of op-amp.



HIGH FREQUENCY MODEL OF OPAMP

Frequency response

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➢ Its open loop gain is 90dB with d.c.signal and this gain should remain the same through audio and radio frequency

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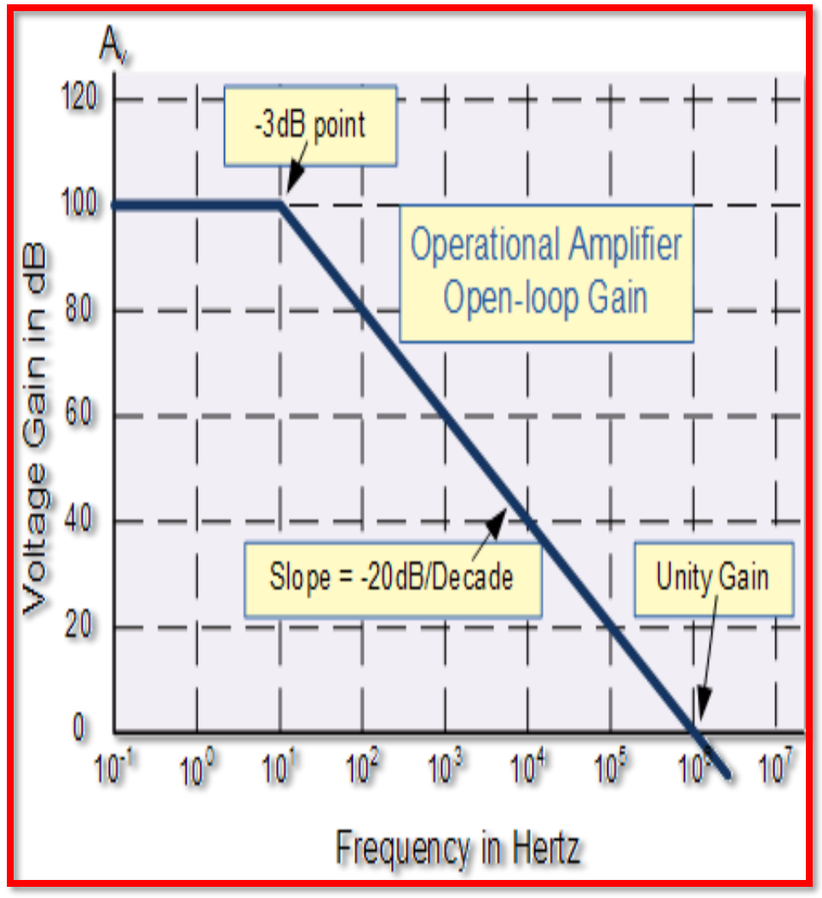
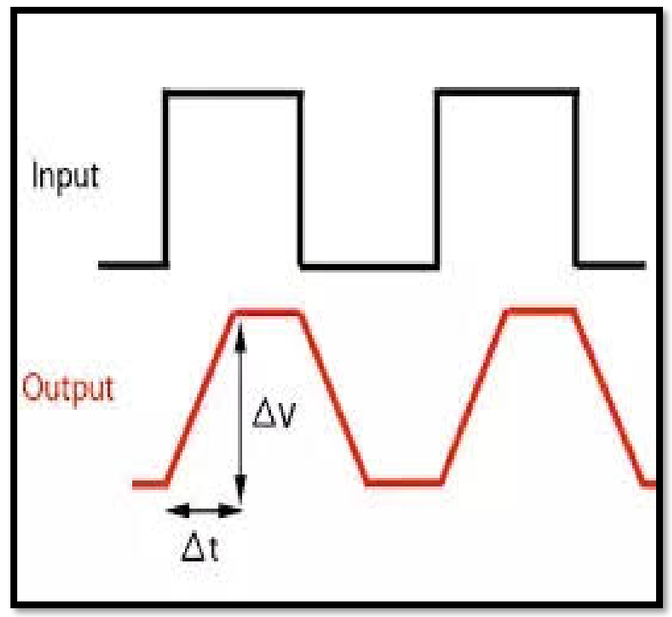


Slew rate

- The slew rate is defined as the maximum rate of change of output voltage caused by a step input voltage., Specified in V/μs

eg : 1V/micro sec. slew rate denotes the output rises or falls by 1 volts in 1 micro seconds



- The rate at which the voltage across the capacitor dVc/dt is given by

  dVc/dt = I/C , Slew rate SR dVc/dt|max= Imax/ C

- For IC741, Imax= 15 micro amps, C= 30 Pico farad

  Slew rate = 0.5V/ micro sec

THANK YOU