RRB JE | SSE 2023

Foundation Batch

Analog Electronics

Day-4

> LIVE

1 PM LAWRENCE Sir

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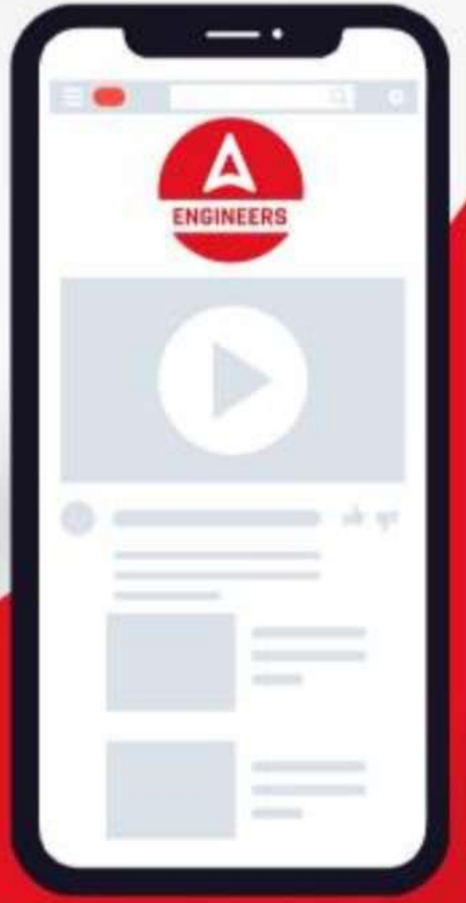

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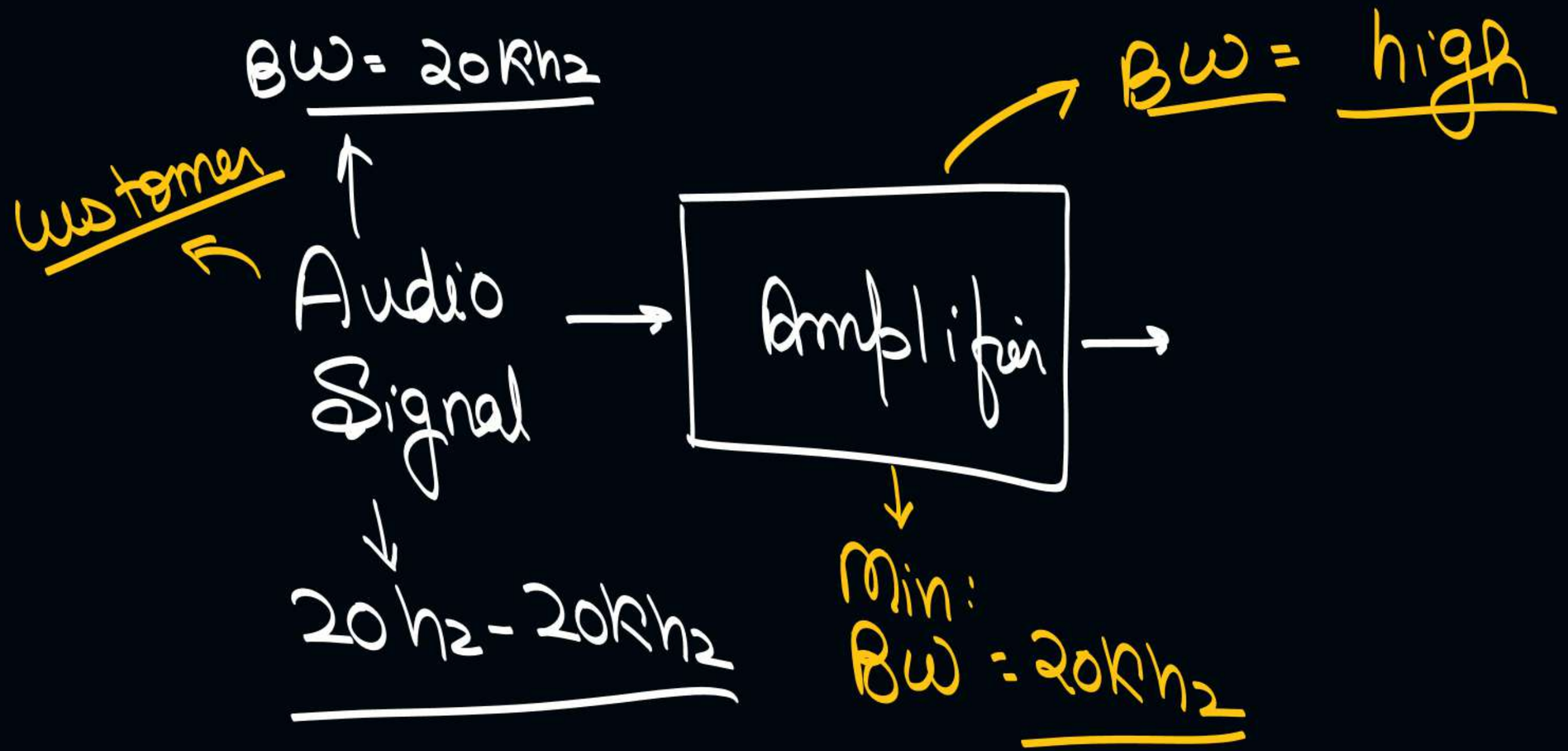
Char of OP-Amp:

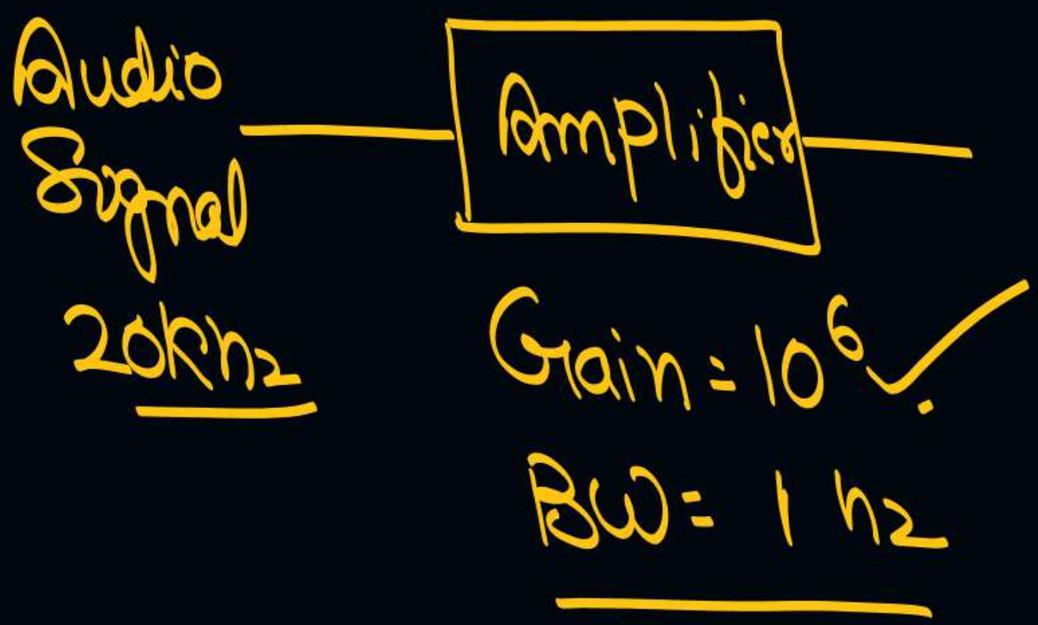
Char	Ideal	Practical
R_i	∞	$10^6\,\Omega$
R_o	0	$10-100\,\Omega$
A_V	∞	10^6

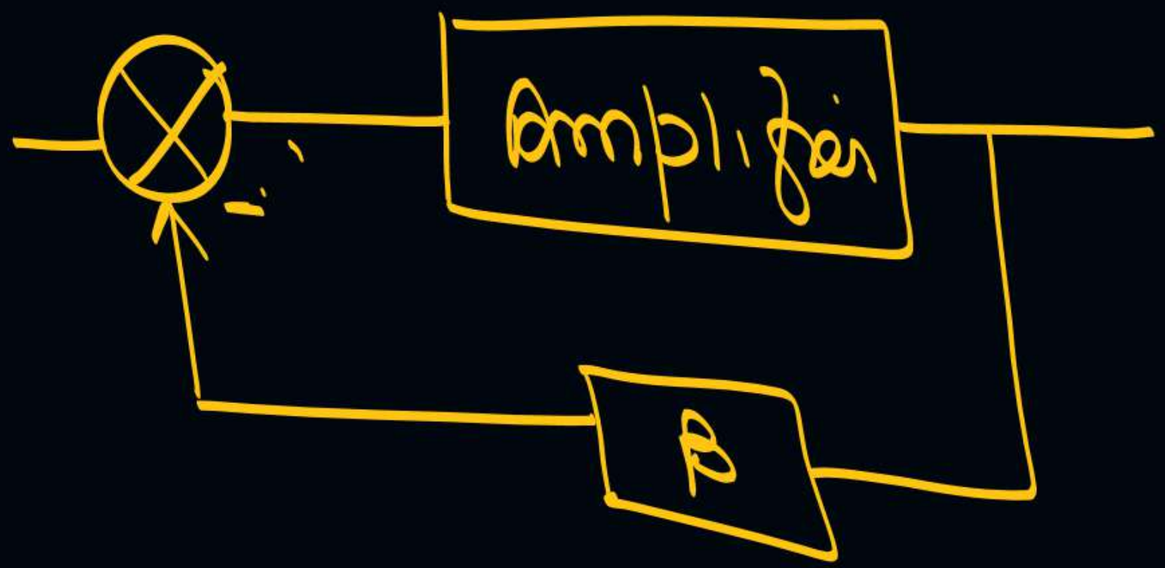
Char	Ideal	Practical
Bandwidth	∞	10^6
Gain x BW : constant	∞	10^6

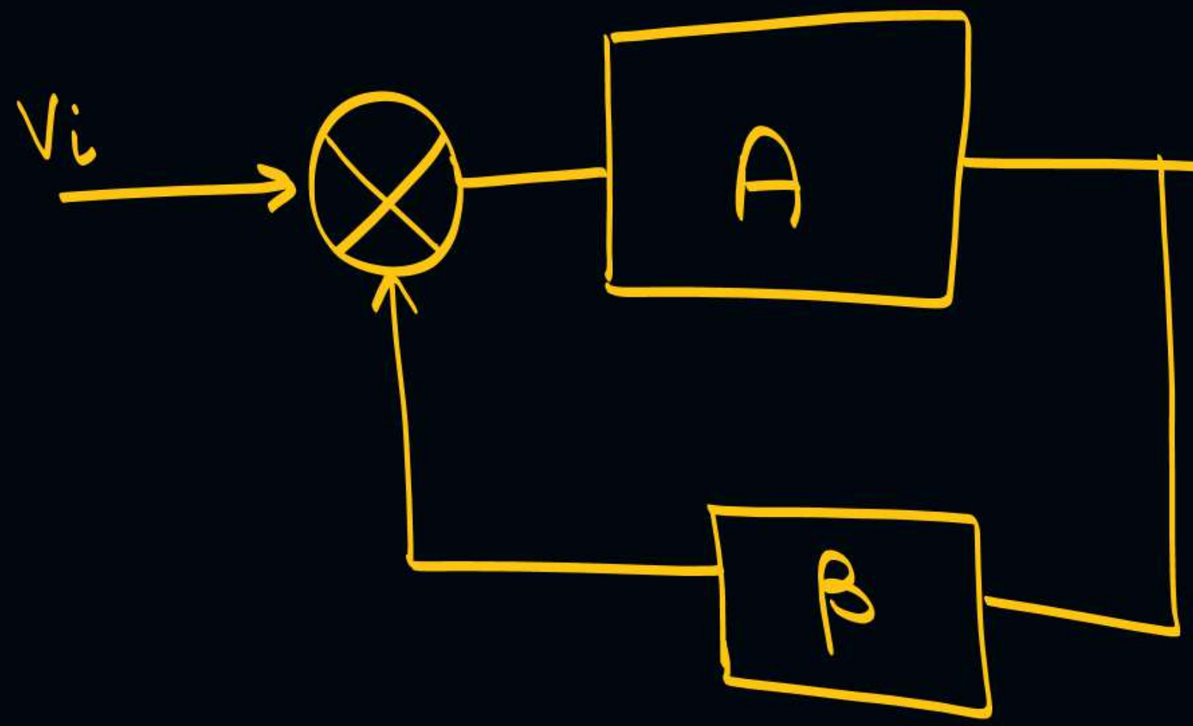


Gain × BW = Constant
= 10^6

Gain = 10
BW = 100Kh2
= 100000 h2





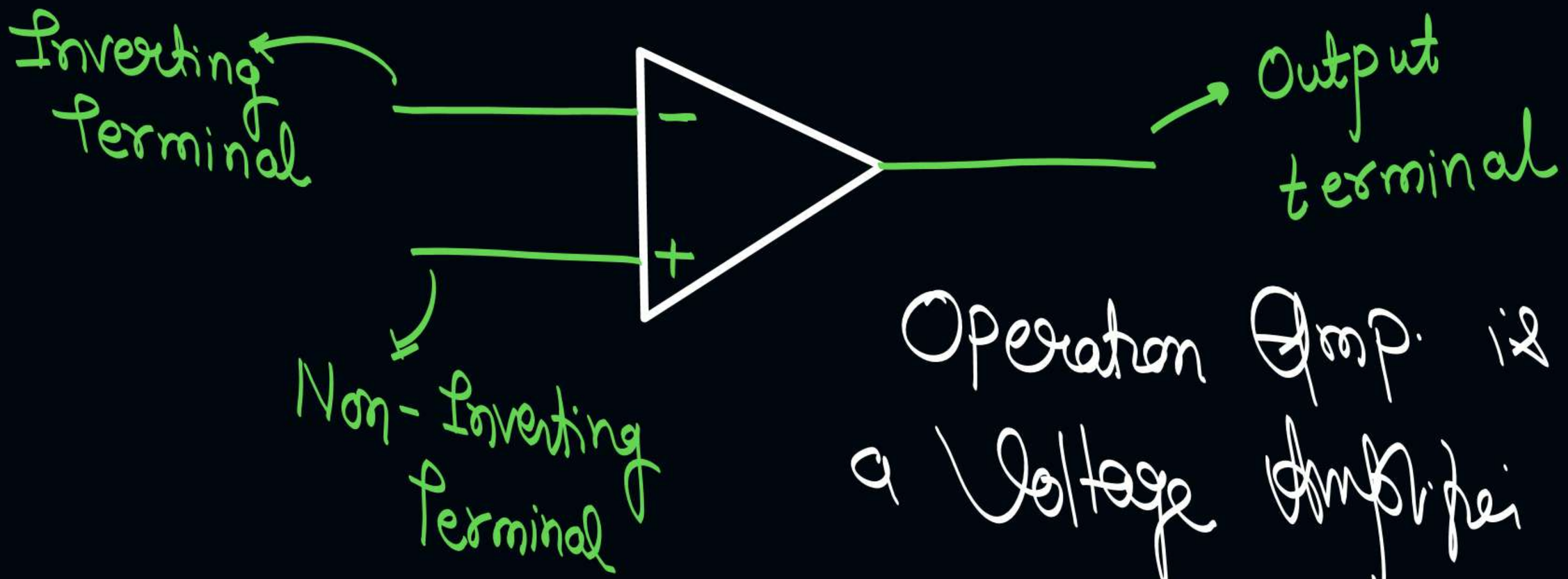


$$\text{Gain} = \frac{V_o}{V_i} = \frac{A}{1+A\beta}$$

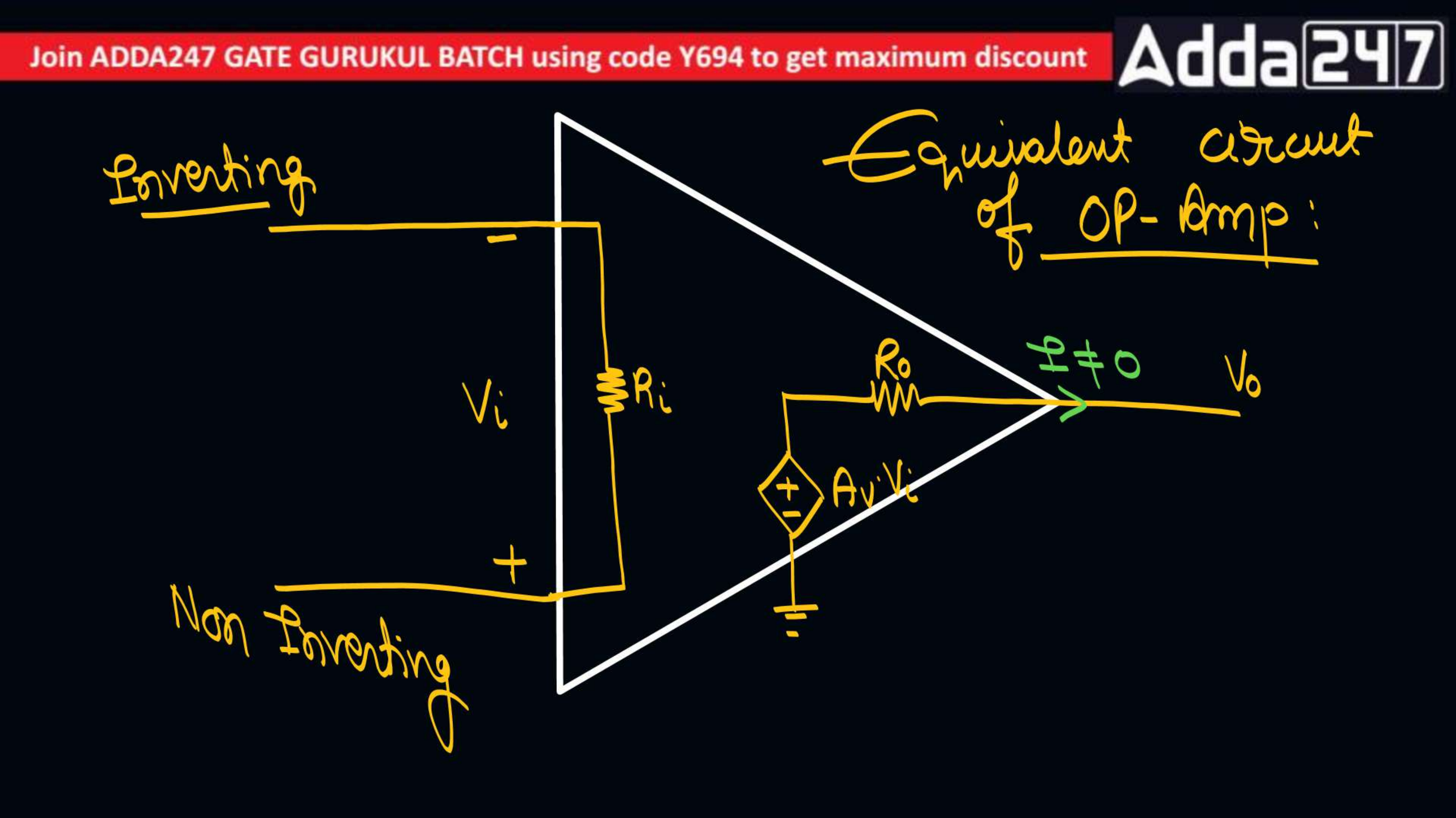
$$= B\omega(1+A\beta)$$

$$\frac{V_o}{V_i} = A$$

Operational Amplifier:



Operation Amp. is a Voltage Amplifier



Virtual Short Concept:

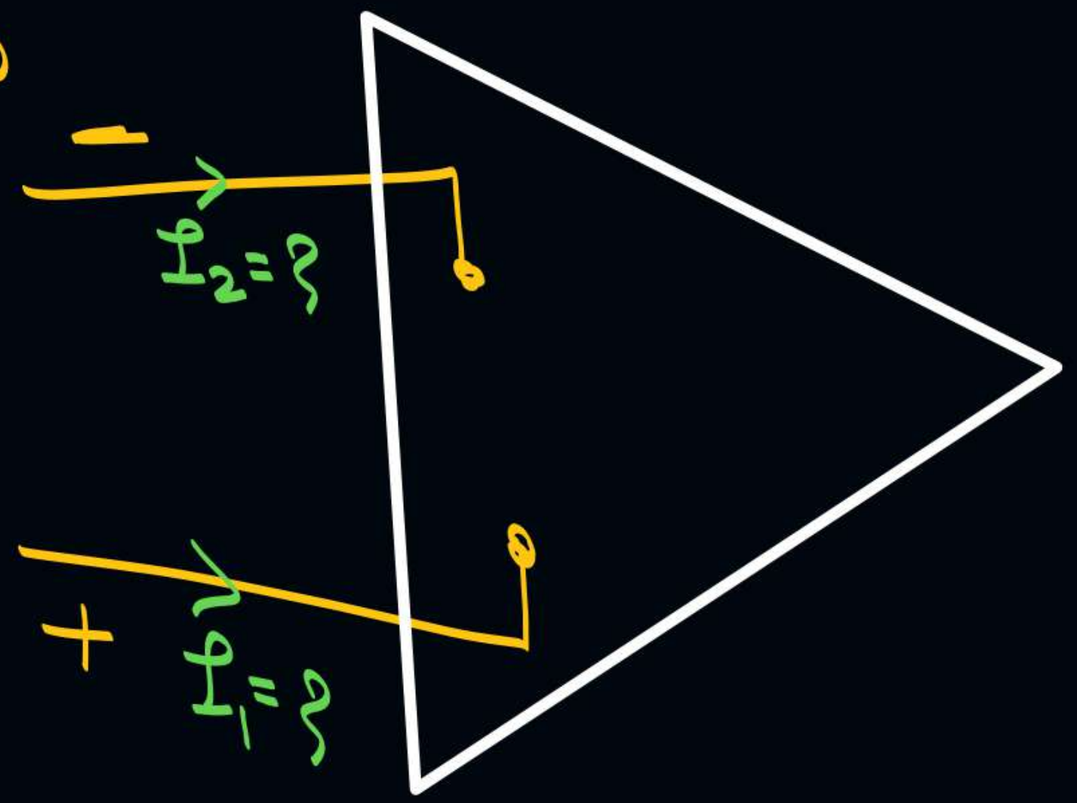
↳ only valid for -ve feedback OP-Amp:

① Op-Amp: Ideal:

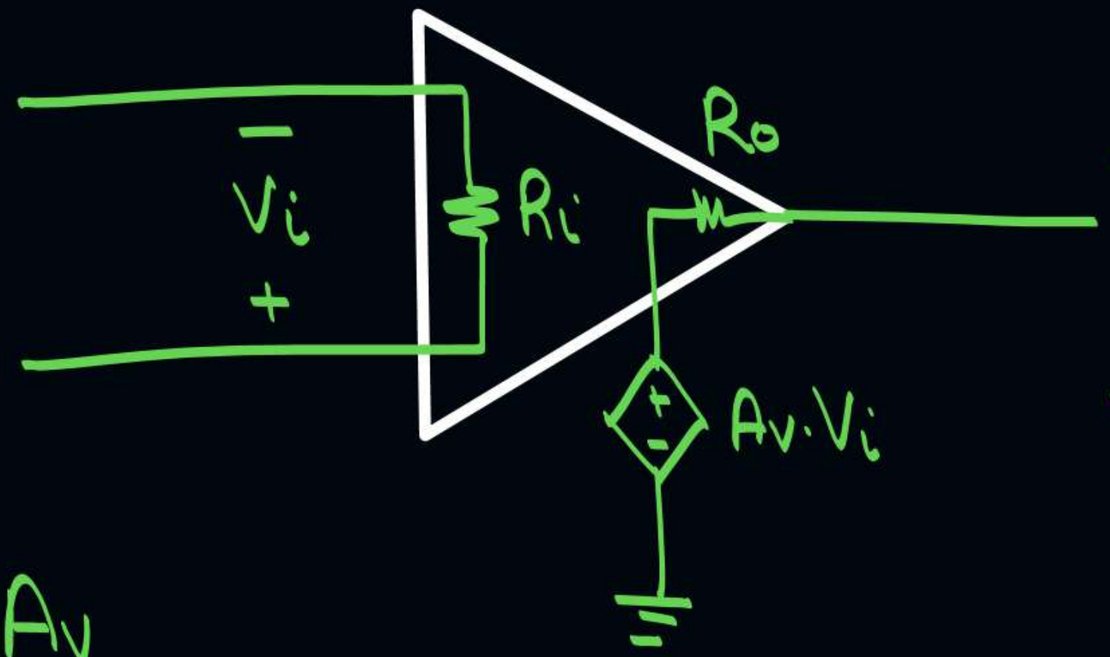
$R_i = \infty$

$I_1 = 0$ Amp

$I_2 = 0$ Amp



$R_o = 0\ \Omega$



$V_o = A_v \cdot V_i$

Gain $= \frac{V_o}{V_i} = A_v$ → Ideally: $A_v = \infty$, $\because V_i = 0$ Volt

$V_i = V_p - V_n$

V_i $R_i = \infty$ ∵ for $A_V = \infty$, $V_i = 0$

$V_p - V_n = 0$

$\boxed{V_p = V_n}$

↳ Virtual Short

OP - Amp :

- −ve feedback → Linear Application
- +ve feedback → Non-linear Application

$A = 10^6$

$BW = 1 hz$

- ve feedback

A = ↓es

BW ↑es

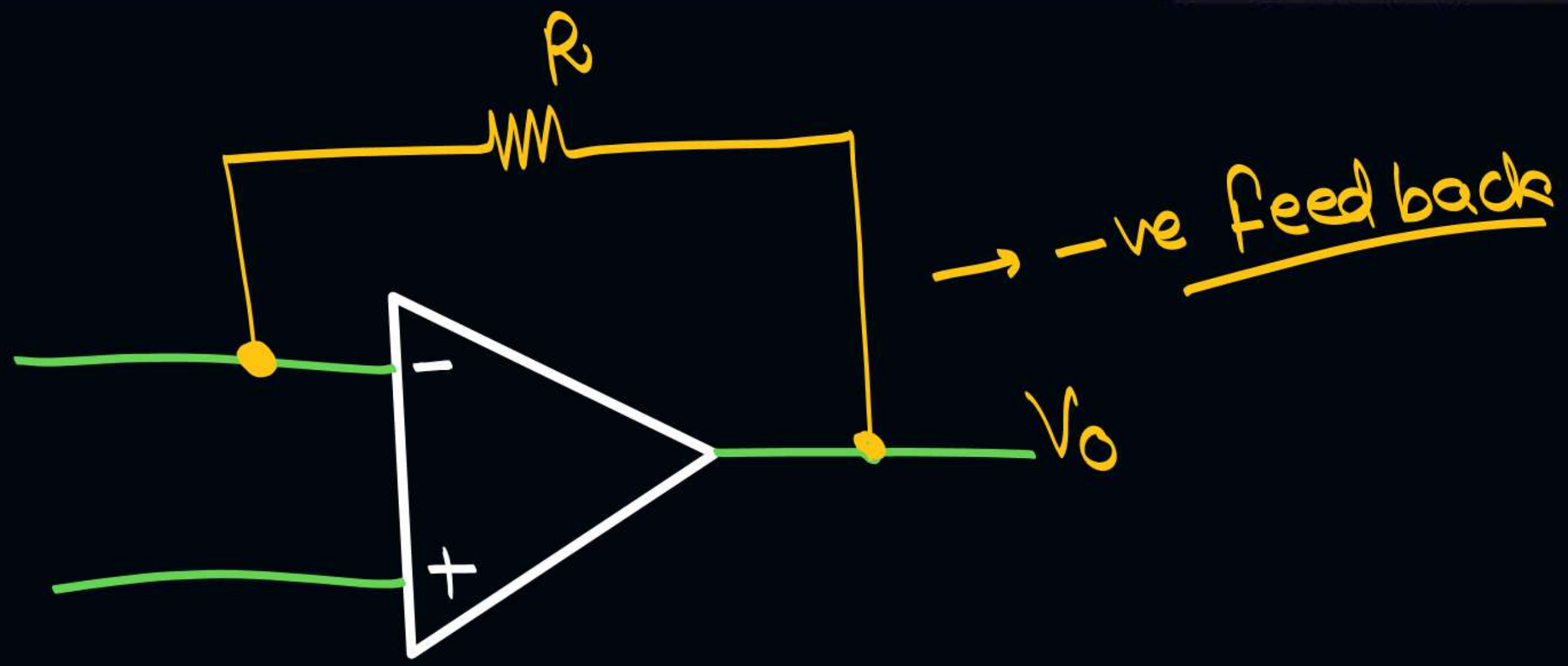
Stability ↑es

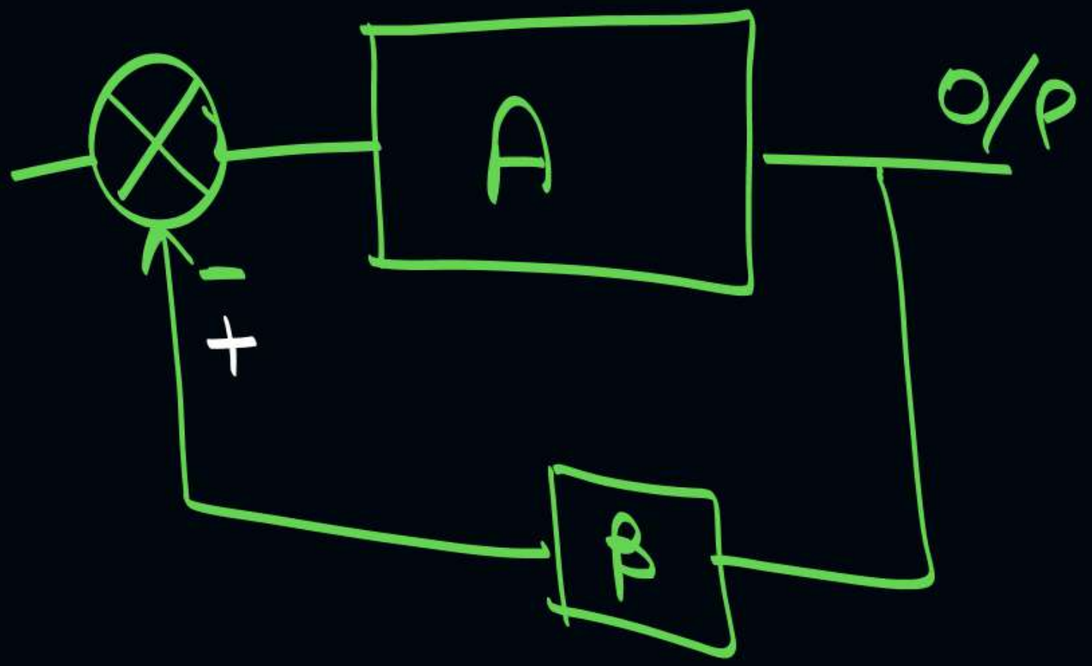
Negative feed back OP-Amp :

- Mode of operation
- Application of OP-Amp :
  - Summer
  - Converter
    - Ln
    - Antilog

Mode of Operation:

- → Inverting Mode
- → Non-Inverting Mode
- → Differential Mode





− → Negative feedback

+ → Positive feedback

Inverting Mode:

If Supply voltage is applied on Inverting Terminal :: Mode of Working is Inverting

Monday : 2:00 PM

→ Friday, Sat, Sun : Off

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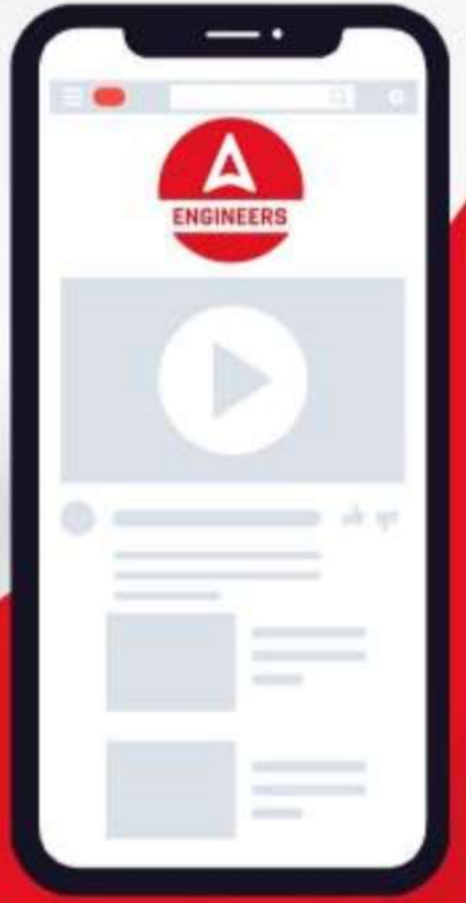

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