INTERNATIONAL
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DESIGN PROCEDURE FOR AN INTEGRATOR

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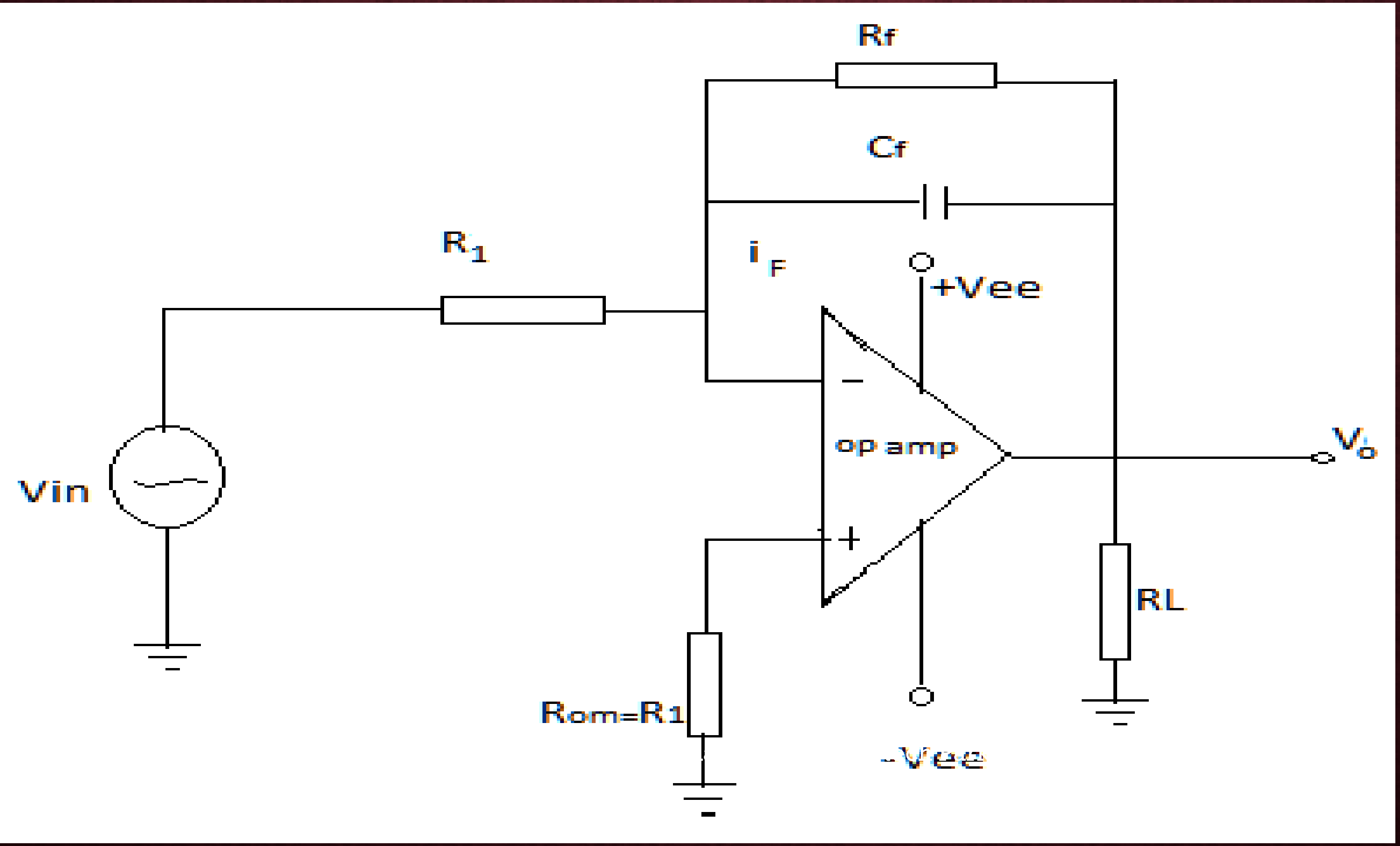
DESIGN PROCEDURE FOR AN INTEGRATOR

- If gain is not given in problem statement assume gain =10
- From the value of gain. Assume R_1 & calculate R_F.
- Calculate fa from fb
- $fa = fb/10$
- Calculate C_F from the value of f_a
- Calculate $R_{Comp} = R_1 \parallel R_F$

PROBLEM STATEMENT TO DESIGN INTEGRATOR

Design a practical Integrator circuit to properly process input sinusodial waveform upto 1kHz . The input amplitude is 10 mV.

CIRCUIT DIAGRAM INTEGRATOR



SOLUTION

- Given $f = 1\,kHz\,; Vi = 10\,mV$
- $\therefore fb = 1\,kHz$
- Assume dc gain 10
- $fb \geq 10\,fa \;\; \& \; fa \leq 100\,Hz$
- $fa = \frac{1}{2\pi\, R_F\, C_F} \quad R_F\, C_F = \frac{1}{2\times3.14\times100\,Hz} = 1.59\times10^{-3}$

SOLUTION

- $\frac{R_F}{R_1} = 10 \;\therefore\; R_1 = 10\,k\Omega \;\&\; R_F = 100\,k\Omega$
- Substituting value of R_F
- $C_F = \frac{1.59 \times 10^{-3}}{100 \times 10^{3}} = 15.91\,nF$

SOLUTION

Calculate $R_{Comp} = R_1 \parallel R_F = 10\ k\Omega \,||\, 100\ k\Omega \approx 10\ k\Omega$