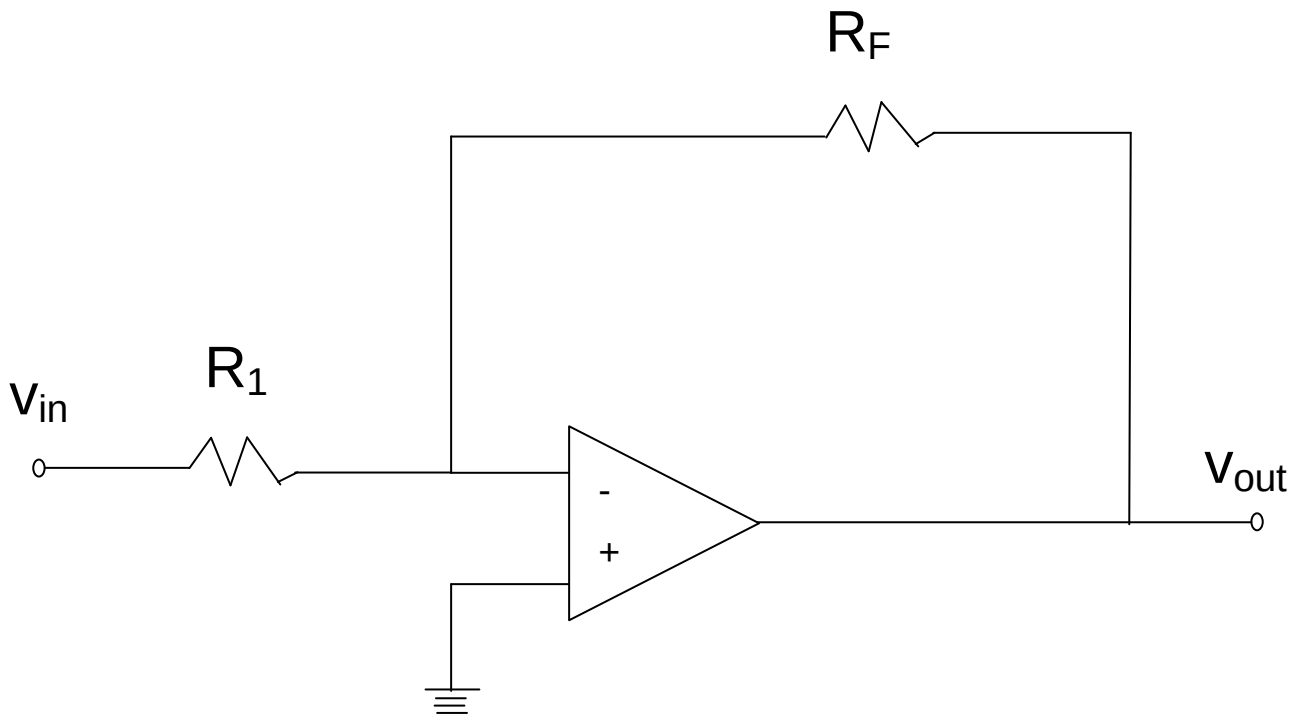
UNIT – VII

Operational Amplifiers

7.1 The open-loop gain of an op-amp is 10^5. An input signal of 1mv is applied to the inverting input with the non-inverting connected to the ground. The supply voltage is ± 10V. The output of the amplifier will be close to,
(a) + 100V
(b) – 100V
(c) + 10V
(d) – 10V

7.2 An op-amp has an open-loop gain of 10^5 and an open-loop upper cut-off frequency is 10 Hz. If this op-amp is connected as an amplifier with a closed loop gain of 100, then the new upper cut-off frequency is
(a) 10 Hz
(b) 100 Hz
(c) 10 kHz
(d) 100 kHz

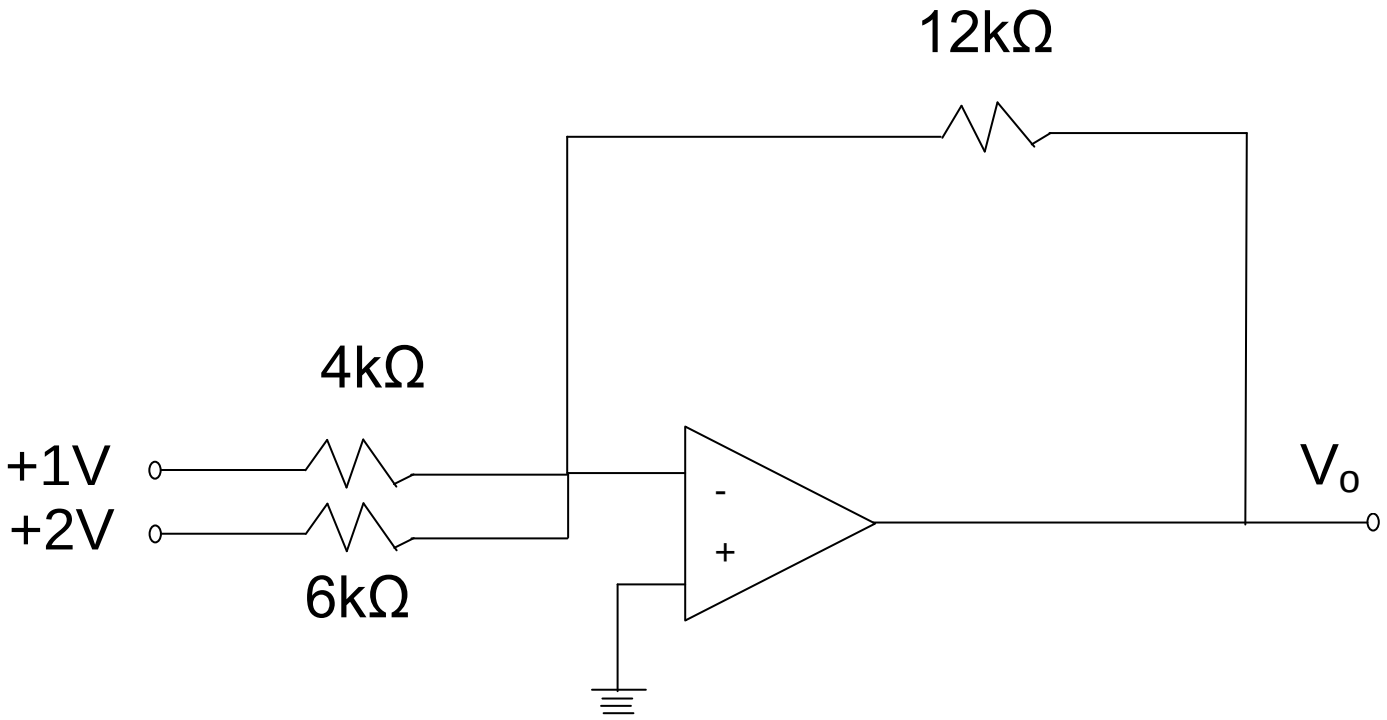
7.3 In the inverting amplifier shown it is desired to realize the input resistance seen by the small signal source to be as large as possible while keeping the voltage gain between -10 and -25. The upper limit of R_F is 1 MΩ. The value of R_1 should be,



(a) Infinity
(b) 1 MΩ
(c) 100 kΩ
(d) 40 kΩ

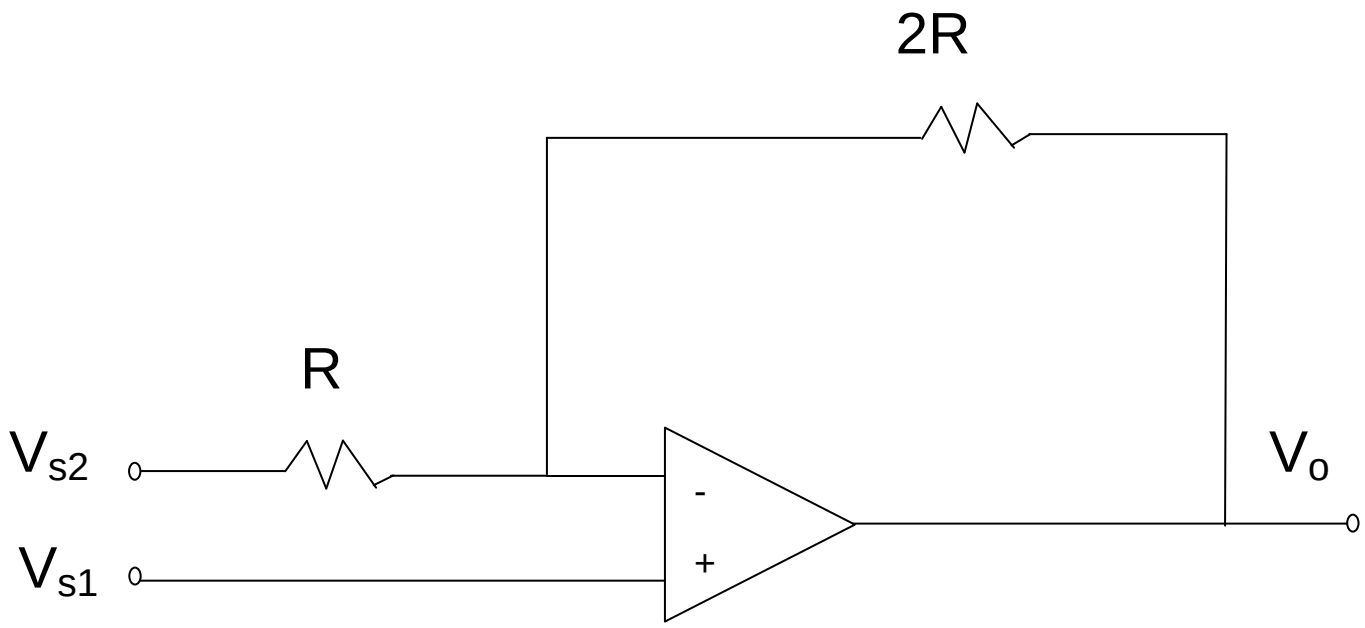
7.4 In the inverting amplifier shown, The resistance R_g is chosen as $R_1 \parallel R_2$ in order to
(a) Increase gain
(b) Reduce off set current
(c) Reduce offset voltage
(d) Increase CMRR

7.5 In the circuit shown, the output voltage, V_o, is



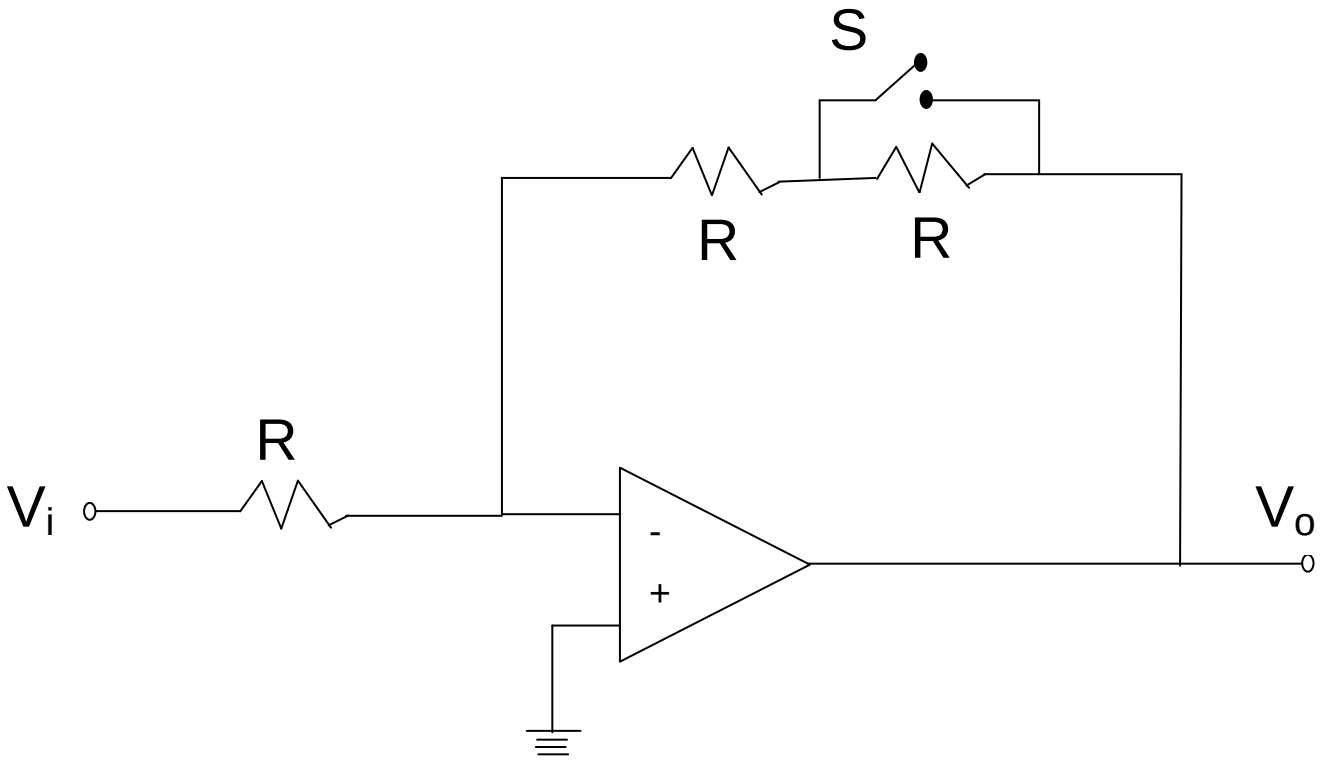
(a) + 3V
(b) – 3V
(c) – 7V
(d) + 7V

7.6 In the op-amp circuit shown, the voltage V_o is,



(a) $3\ V_{s1} - 6\ V_{s2}$
(b) $2\ V_{s1} - 3\ V_{s2}$
(c) $2\ V_{s1} - 2\ V_{s2}$
(d) $3\ V_{s1} - 2\ V_{s2}$

7.7 Let the magnitude of the gain in the inverting op-amp amplifier circuit shown be x with switch S_1 open, when the switch S_1 is closed the magnitude of gain becomes



(a) x/2
(b) – x
(c) 2x
(d) – 2x

7.8 A differential amplifier has a differential gain of 2000 and a common mode gain of 0.2. The CMRR in dB is equal to
(a) 10000
(b) 400
(c) 80
(d) 40

7.9 An op-amp is used in the circuit as shown. Current I_o is

(a) $V_s \times \frac{R_L}{R_s \quad R_L + R_s}$

(b) $\frac{V_s}{R_s}$

(c) $\frac{V_s}{R_L}$

(d) $V_s\left(\frac{1}{R_s}+\frac{1}{R_L}\right)$

7.10 The slew rate of an op-amp is 0.5 V/μS. The maximum frequency of a sinusoidal input of 2V rms that can be handled without excessive distortion is

(a) 3 kHz
(b) 30 kHz
(c) 200 kHz
(d) 2 MHz

Answers:

7.1 (d), 7.2 (c) 7.3 (c) 7.4 (b) 7.5 (c) 7.6 (d) 7.7 (a)

7.8 (c) 7.9 (b) 7.10 (b)