Name:	Dr JBO
Student ID N	umber: Model Answer
Section:	01A / 01B / 02A / 02B
Lecturer:	Dr. Jamaludin Bin Omar

EEEB273/EEEB2014 - Quiz 5 SEMESTER 2, ACADEMIC YEAR 2018/2019 Date: 24 January 2019

Question:





Refer to Figure 1. Given that $R_1 = 12 \text{ k}\Omega$, $R_2 = 20 \text{ k}\Omega$, and $R_F = 24 \text{ k}\Omega$. Using ideal properties of the op-amps:

(a) Determine v_{01} when $v_{11} = 15$ mV and $v_{12} = -20$ mV.	[6 marks]
(b) Find <i>v</i> ₀ .	[4 marks]

Show clearly all calculations in order to get full marks.

Answers:

(a) Inverting summing amp: $v_{01} = -[(R_F/R_1)(v_{I1}) + (R_F/R_2)(v_{I2})]$ [3] = -[(24k/12k)(15m) + (24k/20k)(-20m)] = -[30m - 24m] [2] = -6 mV [1]

(b)

Non-inverting amp: $v_O = (1 + 180k/100k)(v_{O1})$ [2] = (1 + 180k/100k)(-6m) = -16.8 mV [2]

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Refer to Figure 1. Given that $R_1 = 12 \text{ k}\Omega$, $R_2 = 20 \text{ k}\Omega$, and $R_F = 24 \text{ k}\Omega$. Using ideal properties of the op-amps:

(a) Determine v_{01} when $v_{11} = -15$ mV and $v_{12} = +20$ mV.	[6 marks]
(b) Find <i>v</i> ₀ .	[4 marks]

Show clearly all calculations in order to get full marks.

Answers:

(a) Inverting summing amp: $v_{01} = -[(R_F/R_1)(v_{I1}) + (R_F/R_2)(v_{I2})]$ = -[(24k/12k)(-15m) + (24k/20k)(20m)] = -[-30m + 24m][2] = 6 mV [1]

(b)

Non-inverting amp: $v_O = (1 + 180k/100k)(v_{O1})$ [2] = (1 + 180k/100k)(6m) = 16.8 mV [2]

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Figure 1

Refer to Figure 1. Given that $R_1 = 24 \text{ k}\Omega$, $R_2 = 20 \text{ k}\Omega$, and $R_F = 24 \text{ k}\Omega$. Using ideal properties of the op-amps:

(a) Determine v_{01} when $v_{11} = -15$ mV and $v_{12} = 20$ mV.	[6 marks]
(b) Find <i>v</i> ₀ .	[4 marks]

Show clearly all calculations in order to get full marks.

Answers:

(a) Inverting summing amp: $v_{01} = -[(R_F/R_1)(v_{I1}) + (R_F/R_2)(v_{I2})]$ [3] = -[(24k/24k)(-15m) + (24k/20k)(20m)] = -[-15m + 24m] [2] = -9 mV [1]

(b)

Non-inverting amp: $v_0 = (1 + 180k/100k)(v_{01})$ [2] = (1 + 180k/100k)(-9m) = -25.2 mV [2]

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Figure 1

Refer to Figure 1. Given that $R_1 = 24 \text{ k}\Omega$, $R_2 = 20 \text{ k}\Omega$, and $R_F = 24 \text{ k}\Omega$. Using ideal properties of the op-amps:

(a) Determine v_{01} when $v_{11} = 15$ mV and $v_{12} = -20$ mV.	[6 marks]
(b) Find <i>v</i> ₀ .	[4 marks]

Show clearly all calculations in order to get full marks.

Answers:

(a) Inverting summing amp: $v_{01} = -[(R_F/R_1)(v_{I1}) + (R_F/R_2)(v_{I2})] = -[15m - 24m]$ = -[(24k/24k)(15m) + (24k/20k)(-20m)] = -[15m - 24m] = 9 mV[1]

(b)

Non-inverting amp: $v_0 = (1 + 180k/100k)(v_{01})$ [2] = (1 + 180k/100k)(9m) = 25.2 mV [2]