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

EEEB273 - Quiz 7
SEMESTER 2, ACADEMIC YEAR 2016/2017
Date: 17 January 2017 Time: 15 minutes -

Question:

Refer to **ideal** inverting op-amp in **Figure 1**. **Calculate** its absolute minimum and maximum values of the closed-loop voltage gain ($A_v = v_O/v_I$) if R_1 = **20 kΩ**, R_2 = **20 kΩ**, and potentiometer R_{2V} = **0 to 30 kΩ.**

Show your calculation clearly. [10 marks]

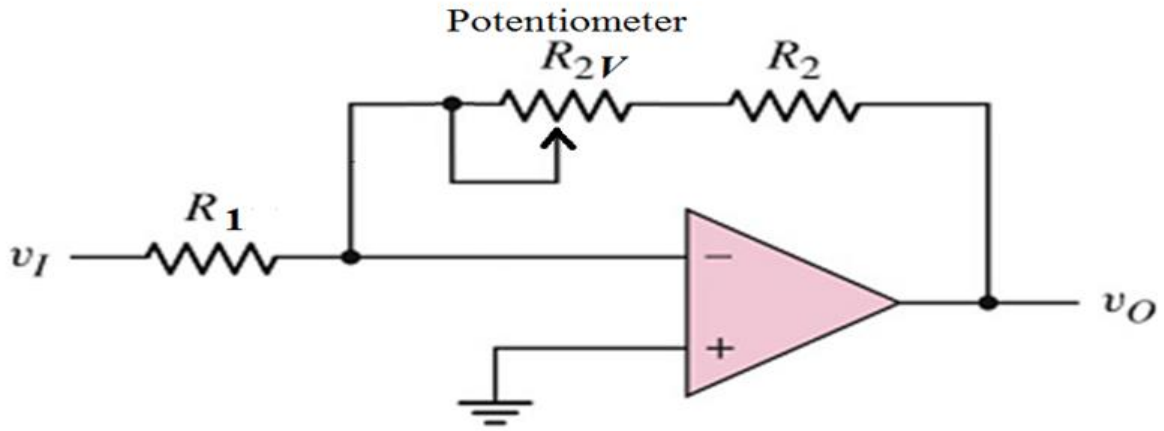

Figure 1

Answer:

$A_v = v_O / v_I = -(R_2 + R_{2V}) / R_1$ **[1]**

R_2 (min) = R_2 = 20 kΩ **[1]**
R_2 (max) = $R_2 + R_{2V}$ = 20 kΩ + 30 kΩ = 50 kΩ **[1]**
R_1 = 20 kΩ **[1]**

A_v(min) = - R_2 (min) / R_1 **[2]**
⇨ A_v(min) = -20k/20k = -1 V/V **[1]**

A_v(max) = - R_2 (max) / R_1 **[2]**
⇨ A_v(max) = = -50k/20k = -2.5 V/V **[1]**

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Question:

Refer to **ideal** inverting op-amp in **Figure 1**. **Calculate** its absolute minimum and maximum values of the closed-loop voltage gain ($A_v = v_O/v_I$) if R_1 = **15 kΩ**, R_2 = **10 kΩ**, and potentiometer R_{2V} = **0 to 30 kΩ.**

Show your calculation clearly. [10 marks]

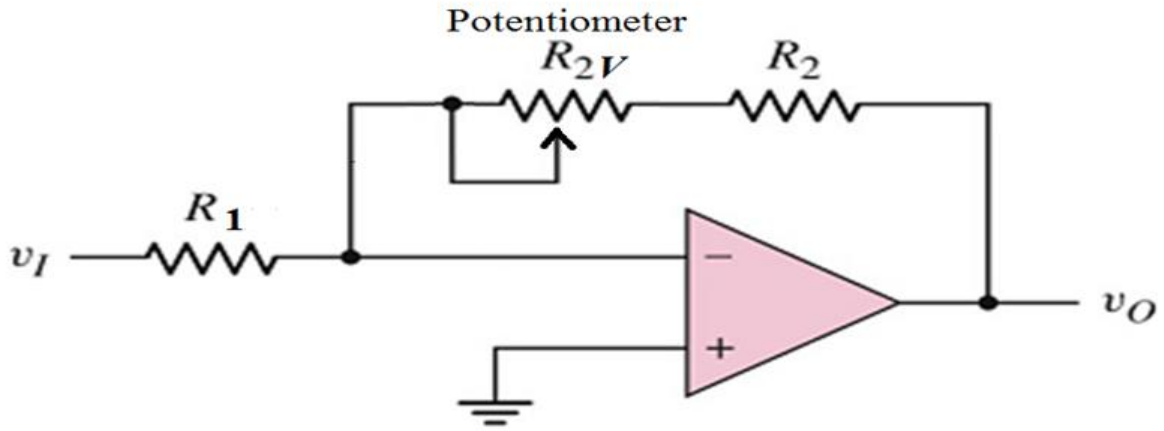

Figure 1

Answer:

$A_v = v_O / v_I = -(R_2 + R_{2V}) / R_1$ **[1]**

R_2 (min) = R_2 = 10 kΩ **[1]**
R_2 (max) = $R_2 + R_{2V}$ = 10 kΩ + 30 kΩ = 40 kΩ **[1]**
R_1 = 15 kΩ **[1]**

A_v(min) = - R_2 (min) / R_1 **[2]**
⇨ A_v(min) = -10k/15k = -0.667 V/V **[1]**

A_v(max) = - R_2 (max) / R_1 **[2]**
⇨ A_v(max) = = -40k/15k = -2.667 V/V **[1]**

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Question:

Refer to **ideal** inverting op-amp in **Figure 1**. **Calculate** its absolute minimum and maximum values of the closed-loop voltage gain ($A_v = v_O/v_I$) if R_1 = **25 kΩ**, R_2 = **20 kΩ**, and potentiometer R_{2V} = **0 to 20 kΩ.**

Show your calculation clearly. [10 marks]

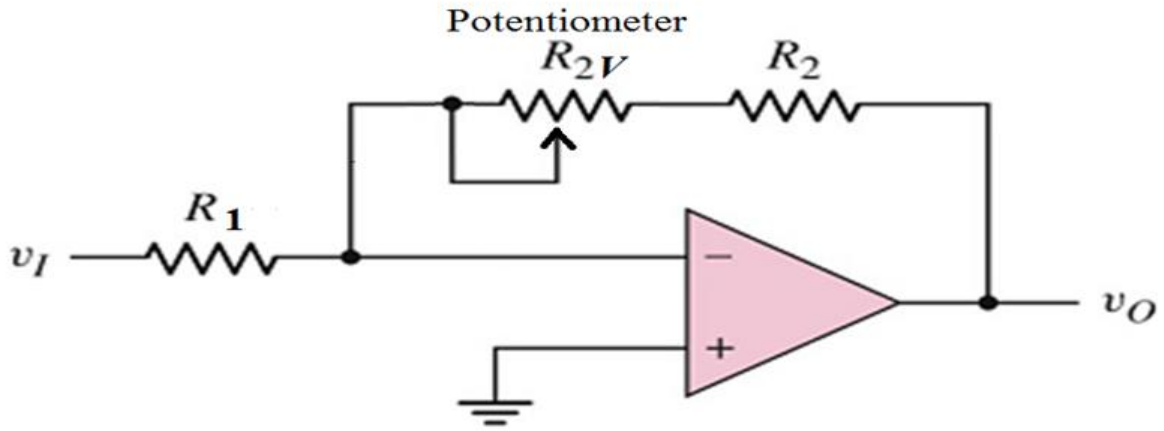

Figure 1

Answer:

$A_v = v_O / v_I = -(R_2 + R_{2V}) / R_1$ **[1]**

R_2 (min) = R_2 = 20 kΩ **[1]**
R_2 (max) = $R_2 + R_{2V}$ = 20 kΩ + 20 kΩ = 40 kΩ **[1]**
R_1 = 25 kΩ **[1]**

A_v(min) = - R_2 (min) / R_1 **[2]**
⇨ A_v(min) = -20k/25k = -0.8 V/V **[1]**

A_v(max) = - R_2 (max) / R_1 **[2]**
⇨ A_v(max) = = -40k/25k = -1.6 V/V **[1]**

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Question:

Refer to **ideal** inverting op-amp in **Figure 1**. **Calculate** its absolute minimum and maximum values of the closed-loop voltage gain ($A_v = v_O/v_I$) if R_1 = **20 kΩ**, R_2 = **25 kΩ**, and potentiometer R_{2V} = **0 to 25 kΩ.**

Show your calculation clearly. [10 marks]

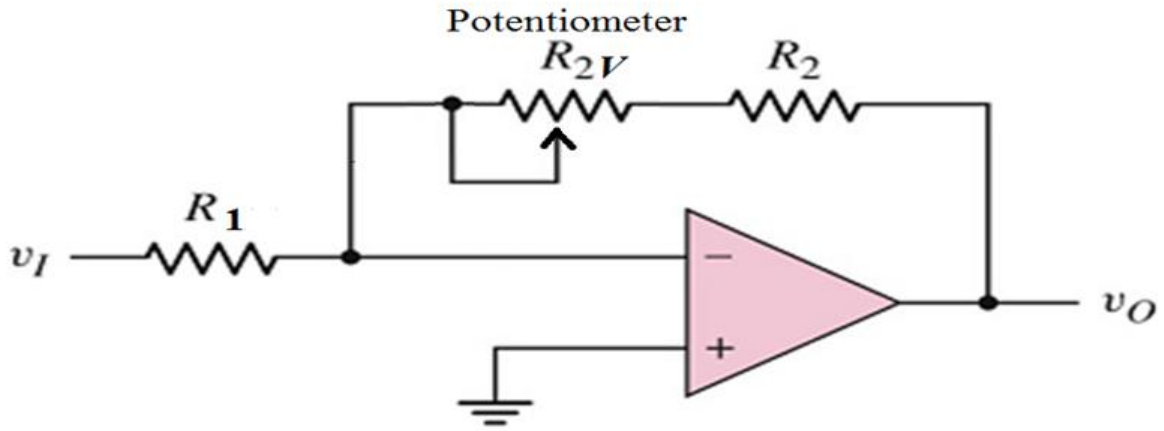

Figure 1

Answer:

$A_v = v_O / v_I = -(R_2 + R_{2V}) / R_1$ **[1]**

R_2 (min) = R_2 = 25 kΩ **[1]**
R_2 (max) = $R_2 + R_{2V}$ = 25 kΩ + 25 kΩ = 50 kΩ **[1]**
R_1 = 20 kΩ **[1]**

A_v(min) = - R_2 (min) / R_1 **[2]**
⇨ A_v(min) = -25k/20k = -1.25 V/V **[1]**

A_v(max) = - R_2 (max) / R_1 **[2]**
⇨ A_v(max) = = -50k/20k = -2.5 V/V **[1]**