Name:	**Dr JBO**
Student ID Number:	**Model Answer**
Section: 04 A/B	
Lecturer: Dr. Jamaludin Bin Omar	

EEEB273 - Quiz 7 .
SEMESTER 1, ACADEMIC YEAR 2017/2018
Date: 30 August 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 ($A_v = v_O/v_I$) when R_1 = **20 kΩ**, potentiometer R_{1V} = **0 to 30 kΩ**, and R_2 = **20 kΩ**.

Show your calculation clearly. [10 marks]

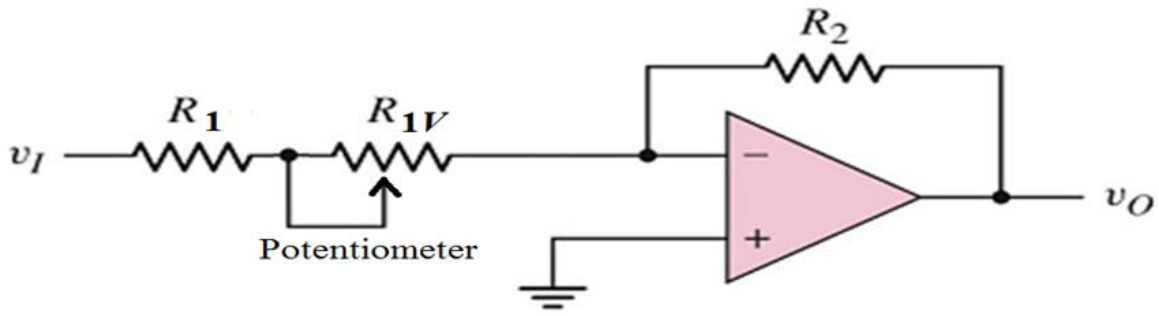

Figure 1

Answer:

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

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

Absolute value of A_v is maximum when R_{1V} is minimum.
A_v(max) = - R_2 / R_1 (min) **[2]**
⇨ A_v(max) = -20k/20k = -1 V/V **[1]**

A_v(min) = - R_2 / R_1(max) **[2]**
⇨ A_v(min) = = -20k/50k = -0.4 V/V **[1]**

Name:	**Dr JBO**
Student ID Number:	**Model Answer**
Section: 04 A/B	
Lecturer: Dr. Jamaludin Bin Omar	

EEEB273 - Quiz 7 ,
SEMESTER 1, ACADEMIC YEAR 2017/2018
Date: 30 August 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 ($A_v = v_O/v_I$) when R_1 = **10 kΩ**, potentiometer R_{1V} = **0 to 30 kΩ**, and R_2 = **15 kΩ**.

Show your calculation clearly. [10 marks]

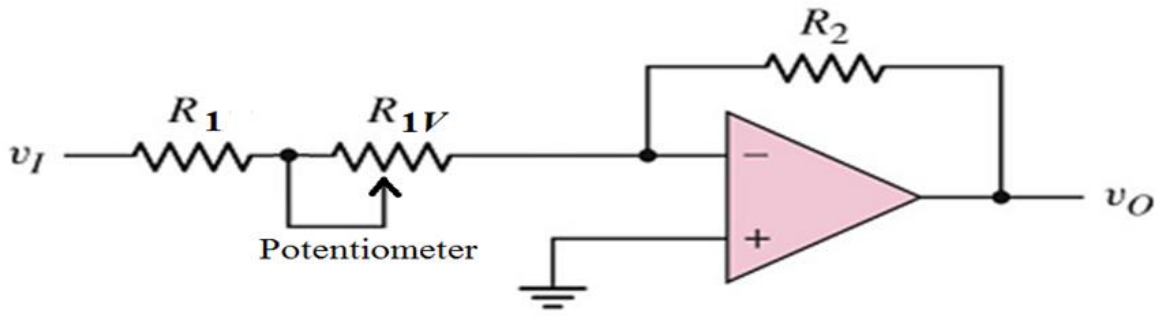

Figure 1

Answer:

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

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

Absolute value of A_v is maximum when R_{1V} is minimum.
A_v(max) = - R_2 / R_1 (min) **[2]**
⇨ A_v(max) = -15k/10k = -1.5 V/V **[1]**

A_v(min) = - R_2 / R_1(max) **[2]**
⇨ A_v(min) = = -15k/40k = -0.375 V/V **[1]**

Name:	**Dr JBO**
Student ID Number:	**Model Answer**
Section: 04 A/B	
Lecturer: Dr. Jamaludin Bin Omar	

EEEB273 - Quiz 7 ;
SEMESTER 1, ACADEMIC YEAR 2017/2018
Date: 30 August 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 ($A_v = v_O/v_I$) when R_1 = **20 kΩ**, potentiometer R_{1V} = **0 to 20 kΩ**, and R_2 = **25 kΩ**.

Show your calculation clearly. [10 marks]

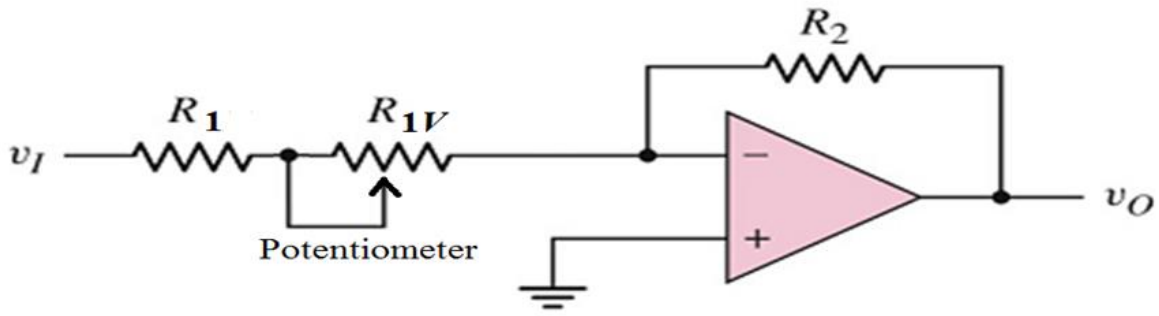

Figure 1

Answer:

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

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

Absolute value of A_v is maximum when R_{1V} is minimum.
A_v(max) = - R_2 / R_1 (min) **[2]**
⇨ A_v(max) = -25k/20k = -1.25 V/V **[1]**

A_v(min) = - R_2 / R_1(max) **[2]**
⇨ A_v(min) = = -25k/40k = -0.625 V/V **[1]**

Name:	**Dr JBO**
Student ID Number:	**Model Answer**
Section: 04 A/B	
Lecturer: Dr. Jamaludin Bin Omar	

EEEB273 - Quiz 7 :
SEMESTER 1, ACADEMIC YEAR 2017/2018
Date: 30 August 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 ($A_v = v_O/v_I$) when R_1 = **25 kΩ**, potentiometer R_{1V} = **0 to 25 kΩ**, and R_2 = **20 kΩ**.

Show your calculation clearly. [10 marks]

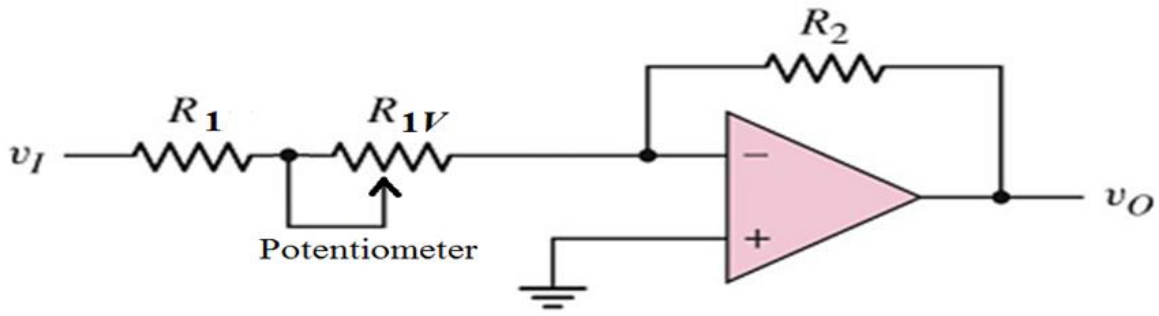

Figure 1

Answer:

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

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

Absolute value of A_v is maximum when R_{1V} is minimum.
A_d(max) = - R_2 / R_1 (min) **[2]**
⇨ A_d(max) = -20k/25k = -0.8 V/V **[1]**

A_v(min) = - R_2 / R_1(max) **[2]**
⇨ A_v(min) = = -20k/50k = -0.4 V/V **[1]**