Started on	Friday, 22 July 2022, 8:36 PM
State	Finished
Completed on	Friday, 22 July 2022, 10:02 PM
Time taken	1 hour 26 mins
Grade	**91.00** out of 106.00 (**86**%)

Question **1**

Correct

Mark 2.00 out of 2.00

The gain for a transresistance amplifier has units of :

Select one:

- a. Volts per Amp ✔
- b. Volts per Volt
- c. Amps per Volt
- d. Amps per Amp
- e. None of these

Correct

Marks for this submission: 2.00/2.00.

Question **2**

Correct

Mark 2.00 out of 2.00

If an amplifier uses a current input and a voltage output, then it is :

Select one:

- a. A current amplifier
- b. A transresistance amplifier ✔
- c. A transconductance amplifier
- d. None of these
- e. A voltage amplifier

Correct

Marks for this submission: 2.00/2.00.

Question **3**

Correct

Mark 2.00 out of 2.00

Which of the following is true for a DC coupled amplifier with a single high frequency pole?

Select one:

- a. Above this pole frequency, the magnitude of the gain will be approximately constant
- b. At this pole frequency, the phase of the gain will be +45 degrees above the midband value
- c. At this pole frequency, the magnitude of the gain will be +3dB above the midband value
- d. Above this pole frequency, the magnitude of the gain will roll off at -20dB/decade as frequency increases ✔
- e. None of these

Correct

Marks for this submission: 2.00/2.00.

Question **4**

Correct

Mark 2.00 out of 2.00

For an amplifier with a single low frequency pole, which of the following is true?

Select one:

- a. Below this pole frequency, the phase of the gain will decrease at -45 degrees/decade as frequency increases ✔
- b. At this pole frequency, the magnitude of the gain will be +3dB above the midband value
- c. None of these
- d. At this pole frequency, the phase of the gain will be -45 degrees below the midband value
- e. Below this pole frequency, the magnitude of the gain will roll off at -20dB/decade as frequency increases

Correct

Marks for this submission: 2.00/2.00.

Question **5**

Correct

Mark 2.00 out of 2.00

An amplifier which needs a low input resistance and a high output resistance is :

Select one:

- a. A transresistance amplifier
- b. None of these
- c. A current amplifier ✔
- d. A transconductance amplifier
- e. A voltage amplifier

Correct

Marks for this submission: 2.00/2.00.

Question **6**

Correct

Mark 2.00 out of 2.00

Clipping of an opamp's output voltage can be caused by :

Select one:

- a. Decreasing the closed-loop amplifier gain used
- b. None of these
- c. Increasing the power supply voltages used
- d. Increasing the load resistance used
- e. Increasing the amplitude of the input signal used ✔

Correct

Marks for this submission: 2.00/2.00.

Question **7**

Correct

Mark 1.00 out of 2.00

Above the -3dB frequency of an integrated circuit opamp, the open-loop voltage gain will :

Select one:

- a. Change by 20dB if the frequency changes by a decade
- b. Change by 6dB if the frequency changes by an octave
- c. Be equal to the unity gain frequency divided by the frequency of the signal
- d. Decrease with increasing frequency
- e. All of these ✔

Correct

Marks for this submission: 2.00/2.00. Accounting for previous tries, this gives **1.00/2.00**.

Question **8**

Correct

Mark 2.00 out of 2.00

Which of the following is NOT true for an inverting summing amplifier built using a single opamp?

Select one:

- a. None of these
- b. The gain for each input can be varied without changing the gain for any other input
- c. The gain for each input will go up as the input resistance for that input goes down
- d. The gain for each input depends only on the value of the resistor connected to that input ✔
- e. The gain for all inputs can be varied by changing the resistor connected in feedback

Correct

Marks for this submission: 2.00/2.00.

Question **9**

Correct

Mark 2.00 out of 2.00

Errors in the output voltage of an actual integrated circuit operational amplifier can be caused by :

Select one:

- a. Zero offset voltages and currents
- b. High bandwidth for high frequency signals
- c. Low open-loop voltage gain ✔
- d. All of these
- e. High slew rate for signals which change quickly

Correct

Marks for this submission: 2.00/2.00.

Question **10**

Correct

Mark 2.00 out of 2.00

Which of the following is NOT true for actual integrated circuit opamps?

Select one:

- a. They trade away extra open-loop gain to achieve more accurate closed-loop gain values
- b. Their open-loop gain decreases as frequency decreases ✔
- c. They depend on the ratio of resistors to set accurate closed-loop gain values
- d. They are almost always used to build amplifiers employing negative feedback
- e. None of these

Correct

Marks for this submission: 2.00/2.00.

Question **11**

Correct

Mark 2.00 out of 2.00

Current amplifiers use a current input signal and a current output signal.

Select one:

- True ✔
- False

Correct

Marks for this submission: 2.00/2.00.

Question **12**

Correct

Mark 2.00 out of 2.00

For an amplifier with a single-time constant low pass response, the phase of the gain decreases at -45 degrees/decade as the frequency is increased from one decade below the corner frequency to one decade above the corner frequency.

Select one:

- (•) True ✔
- ( ) False

Correct

Marks for this submission: 2.00/2.00.

Question **13**

Correct

Mark 0.00 out of 2.00

For an AC coupled amplifier, the phase of the gain approaches 0 degrees for frequencies in the midband which are well above the lower corner frequency but still well below the upper corner frequency.

Select one:

- (•) True ✔
- ( ) False

Correct

Marks for this submission: 2.00/2.00. Accounting for previous tries, this gives **0.00/2.00**.

Question **14**

Correct

Mark 2.00 out of 2.00

The model for a voltage amplifier uses a Norton's equivalent circuit at it's output.

Select one:

- ( ) True
- (•) False ✔

Correct

Marks for this submission: 2.00/2.00.

Question **15**

Correct

Mark 2.00 out of 2.00

If an amplifier needs a low input resistance and a high output resistance, then it is a current amplifier.

Select one:

- (•) True ✔
- ( ) False

Correct

Marks for this submission: 2.00/2.00.

Question **16**

Correct

Mark 2.00 out of 2.00

The gain of a single-pole active filter (one which uses a single RC time constant) rolls off as frequency as varied at a rate of -6 dB per decade.

Select one:

- ( ) True
- (•) False ✔

Correct

Marks for this submission: 2.00/2.00.

Question **17**

Correct

Mark 2.00 out of 2.00

The CMRR for an amplifier is defined as the ratio of the differential-mode gain to the common-mode gain.

Select one:

- (•) True ✔
- ( ) False

Correct

Marks for this submission: 2.00/2.00.

Question **18**

Correct

Mark 2.00 out of 2.00

An ideal opamp has infinite input resistance.

Select one:

- (•) True ✔
- ( ) False

Correct

Marks for this submission: 2.00/2.00.

Question **19**

Correct

Mark 2.00 out of 2.00

Ideal opamp integrators without an extra resistor in parallel with the capacitor have infinite gain at very high frequencies.

Select one:

- ( ) True
- (•) False ✔

Correct

Marks for this submission: 2.00/2.00.

Question **20**

Correct

Mark 2.00 out of 2.00

Differentiators built with opamps use a capacitor between the negative opamp input and the output.

Select one:

- ( ) True
- (•) False ✔

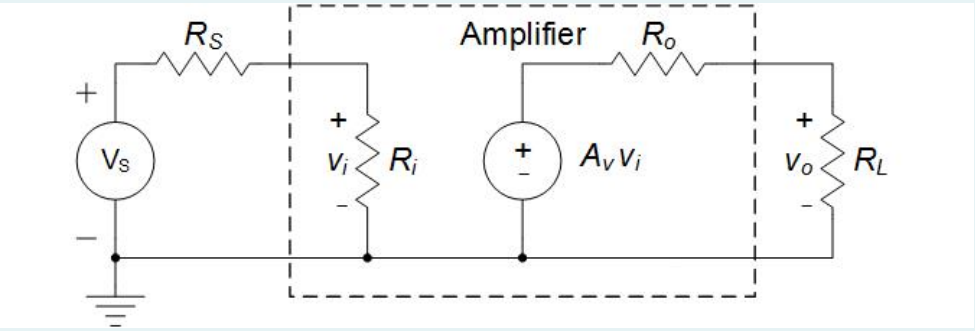
Correct

Marks for this submission: 2.00/2.00.

Question **21**

Correct

Mark 6.00 out of 6.00



What is the value of the voltage gain in V/V for the amplifier circuit shown? Use Rs = 1.1kΩ, RL = 4.7kΩ, Ri = 7.9kΩ, Ro = 17.3kΩ and Av = 152.5 V/V.

Answer: 28.60 ✔

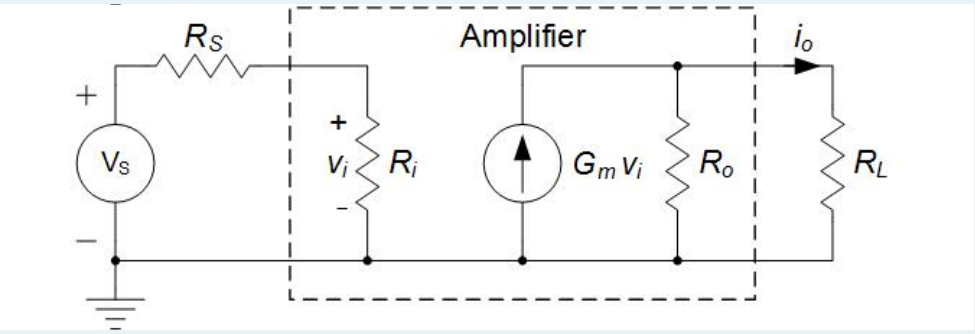
Correct

Marks for this submission: 6.00/6.00.

Question **22**

Correct

Mark 6.00 out of 6.00



For the amplifier shown, what is the smallest output resistance in kΩ that can be used and still get at least 86.8 percent of the amplifier's short circuit output current = GmVi to flow in RL? Use RL = 59.4kΩ.

Answer: 390.6 ✔

Correct

Marks for this submission: 6.00/6.00.

Question **23**

Correct

Mark 6.00 out of 6.00

If the output voltage for an amplifier can only swing up to 1.0V below the positive power supply voltage, and down to 0.5V above the negative power supply voltage, then what DC bias voltage must the amplifier output use in order to be able to output the largest peak-to-peak sine wave possible without clipping? Use VCC = +5V and VEE = -0V.

Answer: 2.25 ✔

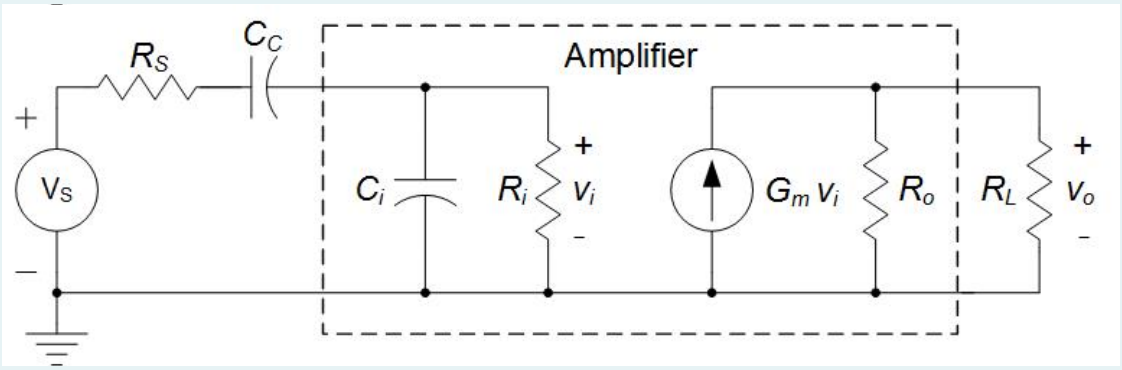
Correct

Marks for this submission: 6.00/6.00.

Question **24**

Correct

Mark 6.00 out of 6.00



What is the frequency in MHz of the high frequency pole for the amplifier shown? Use Rs = 4.1kΩ, Ri = 11.0kΩ, Ro = 29.3kΩ, RL = 25.0kΩ, Cc = 423.8pF, Ci = 4.9pF and Gm = 9.7 mA/V.

Answer: 10.86 ✔

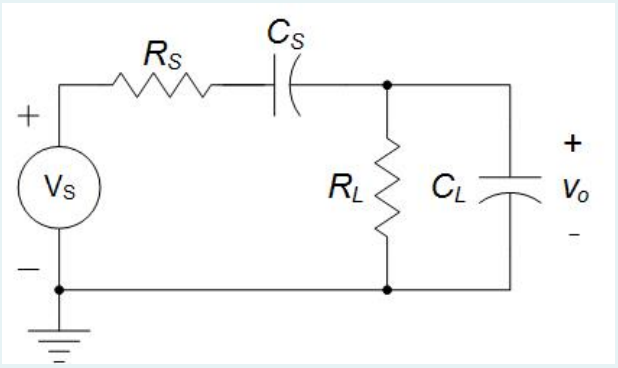
Correct

Marks for this submission: 6.00/6.00.

Question **25**

Incorrect

Mark 0.00 out of 6.00



For the filter circuit shown, what is the frequency in MHz of the high frequency pole for the transfer function Vo/Vs ? Use Rs = 3.4kΩ, RL = 18.2kΩ, Cs = 183.3pF and CL = 4.5pF.

Answer: 8.16 ✖

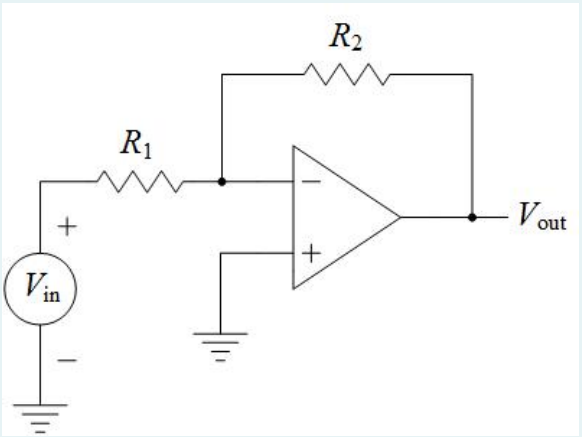
Incorrect

Marks for this submission: 0.00/6.00.

Question **26**

Correct

Mark 6.00 out of 6.00



What is the voltage gain in dB for the operational amplifier circuit shown? Assume that the opamp is ideal, and use R1 = 5.6kΩ and R2 = 48.8kΩ.

Answer: 18.79 ✔

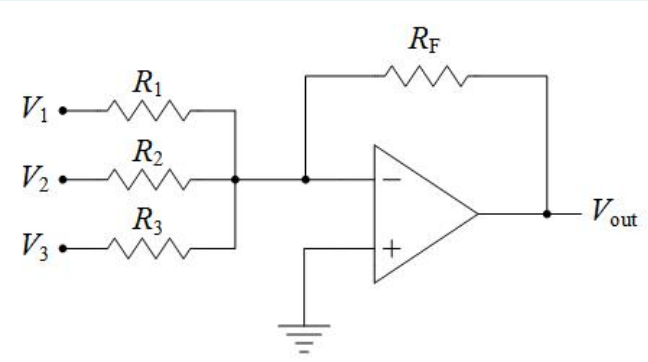
Correct

Marks for this submission: 6.00/6.00.

Question **27**

Correct

Mark 3.00 out of 6.00



What is the voltage gain in V/V from the V3 input to the output for the operational amplifier circuit shown? Assume that the opamp is ideal, and use R1 = 2.1kΩ, R2 = 4.6kΩ, R3 = 9.2kΩ and RF = 82.5kΩ.

Answer: -8.97 ✔

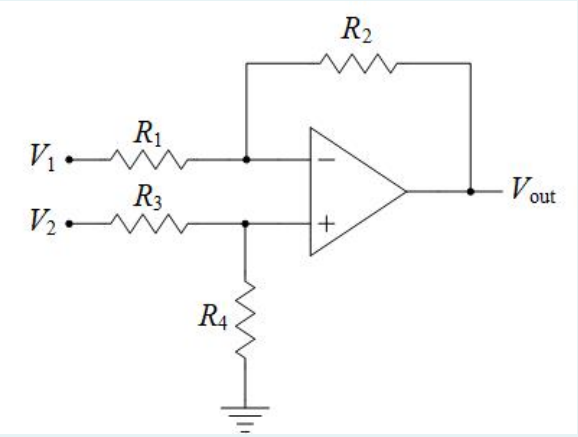
Correct

Marks for this submission: 6.00/6.00. Accounting for previous tries, this gives **3.00/6.00**.

Question **28**

Correct

Mark 6.00 out of 6.00



For the operational amplifier circuit shown, what is the output voltage if V1 = 0.438V and V2 = 1.941V ? Assume that the opamp is ideal, and use R1 = R3 = 3.7kΩ and R2 = R4 = 15.2kΩ.

Answer: 6.17 ✔

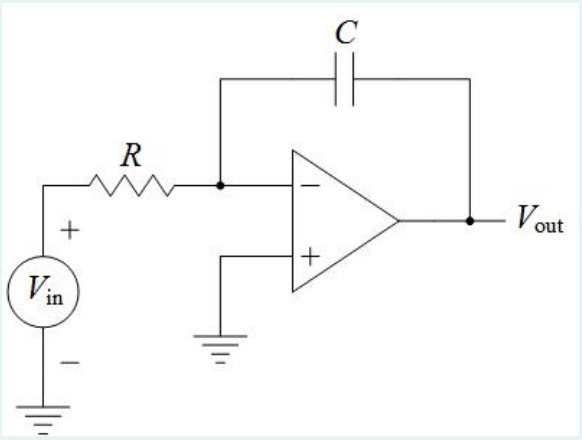
Correct

Marks for this submission: 6.00/6.00.

Question **29**

Correct

Mark 6.00 out of 6.00



For the operational amplifier circuit shown, what is the magnitude of the voltage gain in dB at a frequency of 4.0MHz? Assume that the opamp is ideal, and use R = 1.2kΩ and C = 1.3pF.

Answer: 28.18 ✔

Correct

Marks for this submission: 6.00/6.00.

Question **30**

Correct

Mark 6.00 out of 6.00

If an amplifier with a single-pole rolloff at high frequencies has a midband voltage gain of 65600 V/V and a unity gain frequency of 992.5 MHz, then what is the amplifier's upper -3dB frequency in kilohertz?

Answer: 15.13 ✔

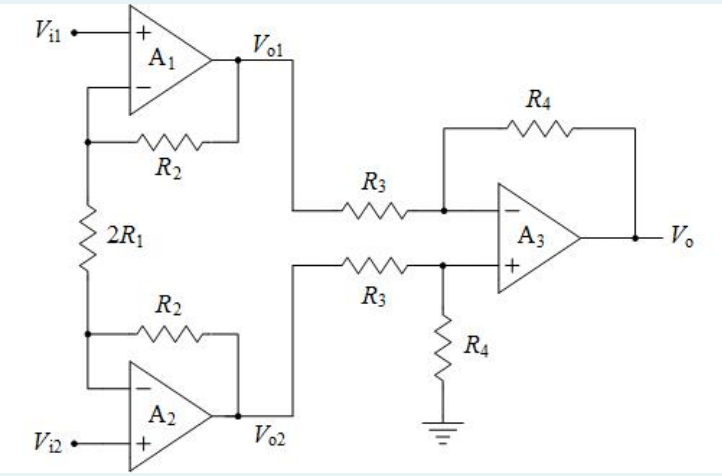
Correct

Marks for this submission: 6.00/6.00.

Question **31**

Correct

Mark 3.00 out of 6.00



What is the differential-mode voltage gain, Adm, in V/V from the differential input voltage, Vidm = Vi2-Vi1, to the output for the operational amplifier circuit shown? Assume that all the opamps are ideal, and use R1 = 7.1kΩ, R2 = 19.6kΩ, R3 = 5.4kΩ and R4 = 64.2kΩ.

Answer: 44.71 ✔

Correct

Marks for this submission: 6.00/6.00. Accounting for previous tries, this gives **3.00/6.00**.

◄ Quiz 8 - BJT and MOS amplifiers

Jump to...

Midterm Exam II ►