Started on	Friday, 22 July 2022, 6:33 PM
State	Finished
Completed on	Friday, 22 July 2022, 8:30 PM
Time taken	1 hour 57 mins
Grade	**92.00** out of 106.00 (**87**%)

Question **1**

Correct

Mark 2.00 out of 2.00

A transconductance amplifier has :

Select one:

- a. A current input and a voltage output
- b. None of these
- c. A current input and a current output
- d. A voltage input and a voltage output
- e. A voltage input and a current output ✔

Correct

Marks for this submission: 2.00/2.00.

Question **2**

Correct

Mark 2.00 out of 2.00

The gain for a transconductance amplifier has units of :

Select one:

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

Correct

Marks for this submission: 2.00/2.00.

Question **3**

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. All of these
- b. At this pole frequency, the phase of the gain will be -45 degrees below the midband value
- c. Below this pole frequency, the phase of the gain will increase at +45 degrees/decade as frequency increases
- d. At this pole frequency, the magnitude of the gain will be +3dB above the midband value
- e. Below this pole frequency, the magnitude of the gain will increase at +20dB/decade as frequency increases ✔

Correct

Marks for this submission: 2.00/2.00.

Question **4**

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

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 low output resistance is :

Select one:

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

Correct

Marks for this submission: 2.00/2.00.

Question **6**

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

Correct

Marks for this submission: 2.00/2.00.

Question **7**

Correct

Mark 2.00 out of 2.00

Which of the following is true for a difference amplifier?

Select one:

- a. They are designed to reject the difference in voltage between the 2 input signals
- b. They are designed to amplify the difference in voltage between the 2 input signals ✔
- c. None of these
- d. Increasing their voltage gain usually requires increasing their input resistance
- e. To achieve a low CMRR the resistors used must match each other well

Correct

Marks for this submission: 2.00/2.00.

Question **8**

Correct

Mark 2.00 out of 2.00

Errors in the output voltage of an actual integrated circuit operational amplifier can NOT be caused by :

Select one:

- a. None of these
- b. Low bandwidth for high frequency signals
- c. Low open-loop voltage gain
- d. Zero offset voltages or currents ✔
- e. Low slew rate for signals which change quickly

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. Non-zero offset voltages or currents ✔
- b. High bandwidth for high frequency signals
- c. None of these
- d. High slew rate for signals which change quickly
- e. High open-loop voltage gain

Correct

Marks for this submission: 2.00/2.00.

Question **10**

Correct

Mark 2.00 out of 2.00

Non-ideal effects in real integrated circuit operational amplifiers will NOT cause :

Select one:

- a. The difference in voltage between the + and – inputs to be zero
- b. The output voltage to be equal to zero when the voltage between the + and – inputs is zero
- c. The difference in voltage between the + and – inputs to decrease as the signal frequency increases ✔
- d. The input currents into the + and – inputs to be zero
- e. None of these

Correct

Marks for this submission: 2.00/2.00.

Question **11**

Correct

Mark 2.00 out of 2.00

Transresistance amplifiers use a voltage 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

The phase shift from a pole asymptotically approaches 0 degrees at frequencies well below the pole frequency, but never completely reaches 0 degrees.

Select one:

- (•) True ✔
- ( ) False

Correct

Marks for this submission: 2.00/2.00.

Question **13**

Correct

Mark 2.00 out of 2.00

For an amplifier with a single-time constant low pass response, the phase of the gain increases 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 **14**

Correct

Mark 2.00 out of 2.00

The model for a transresistance amplifier uses a Thevenin'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 high input resistance and a high output resistance, then it is a transconductance amplifier.

Select one:

- (•) True ✔
- ( ) False

Correct

Marks for this submission: 2.00/2.00.

Question **16**

Correct

Mark 2.00 out of 2.00

Active filters can be built by replacing all of the resistors in an opamp amplifier with capacitors.

Select one:

- ( ) True
- (•) False ✔

Correct

Marks for this submission: 2.00/2.00.

Question **17**

Correct

Mark 2.00 out of 2.00

The Gain-Bandwidth Product of an integrated circuit opamp is equal to the -3dB frequency of the opamp multiplied by the opamp's voltage gain at low frequencies.

Select one:

- (•) True ✔
- ( ) False

Correct

Marks for this submission: 2.00/2.00.

Question **18**

Correct

Mark 2.00 out of 2.00

Ideally, the common-mode gain of a difference amplifier is zero so the CMRR is also zero.

Select one:

- True
- False ✔

Correct

Marks for this submission: 2.00/2.00.

Question **19**

Correct

Mark 0.00 out of 2.00

The closed-loop gain of a non-inverting amplifier built using resistors to provide negative feedback around an integrated circuit opamp is slightly less than one plus the ratio of the resistors used.

Select one:

- True ✔
- False

Correct

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

Question **20**

Correct

Mark 2.00 out of 2.00

An ideal opamp has a zero common-mode rejection ratio.

Select one:

- True
- False ✔

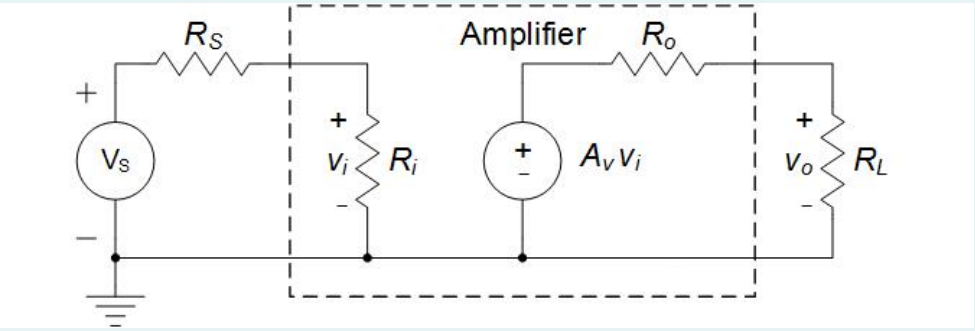
Correct

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 dB for the amplifier circuit shown? Use Rs = 2.4kΩ, RL = 13.7kΩ, Ri = 14.6kΩ, Ro = 1.6kΩ and Av = 82.9 V/V.

Answer: 36.51 ✔

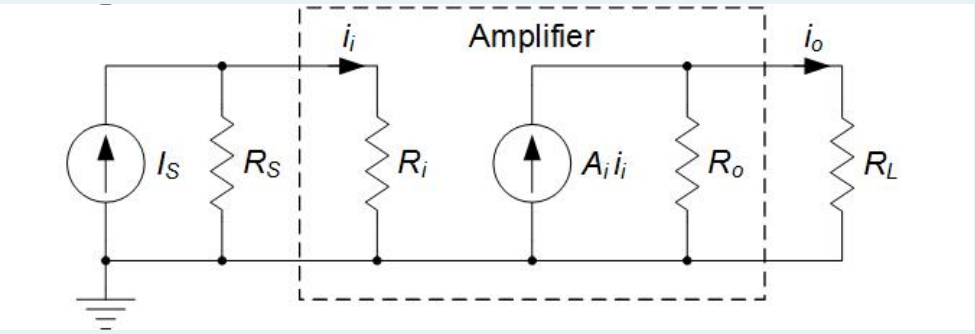
Correct

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 without losing more than 16.7 percent of the amplifier's short circuit output current = Aili in Ro? Use RL = 33.4kΩ.

Answer: 166.6 ✔

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 2.5V below the positive power supply, and down to 1.0V above the negative power supply, then what is the maximum amplitude sine wave in Volts that this amplifier can output without clipping? Use VCC = +15V and VEE = -15V.

Answer: 13.25 ✔

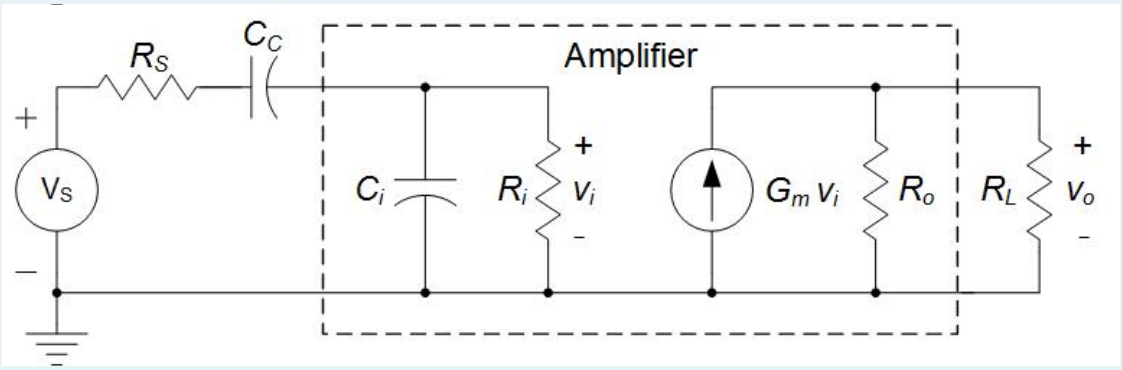
Correct

Marks for this submission: 6.00/6.00.

Question **24**

Correct

Mark 6.00 out of 6.00



What is the value of the midband voltage gain in dB for the amplifier shown? Use Rs = 4.2kΩ, Ri = 13.9kΩ, Ro = 31.8kΩ, RL = 16.0kΩ, Cc = 201.3pF, Ci = 6.9pF and Gm = 11.1 mA/V.

Answer: 39.15 ✔

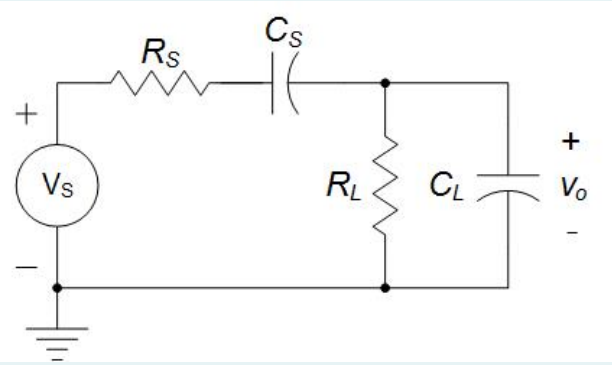
Correct

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 phase in degrees of the transfer function Vo/Vs at a frequency of 0.11MHz? Use Rs = 1.5kΩ, RL = 17.2kΩ, Cs = 390.5pF and CL = 6.3pF.

Answer: 11.77 ✖

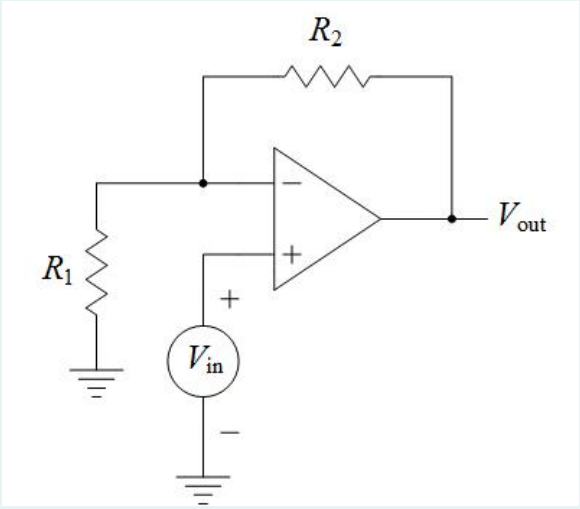
Incorrect

Marks for this submission: 0.00/6.00.

Question **26**

Correct

Mark 6.00 out of 6.00



For the operational amplifier circuit shown, what value must R2 be in kilohms in order to set the voltage gain to 10.0 dB ? Assume that the opamp is ideal, and use R1 = 3.2kΩ.

Answer: 6.91 ✔

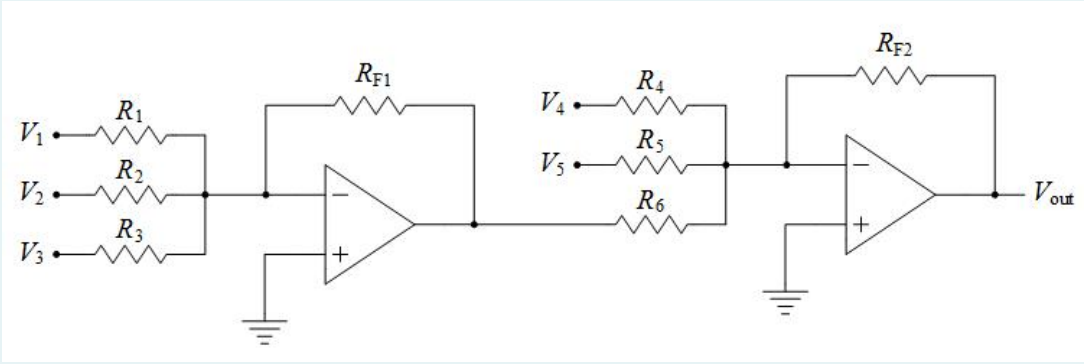
Correct

Marks for this submission: 6.00/6.00.

Question **27**

Correct

Mark 6.00 out of 6.00



For the operational amplifier circuit shown, what is the output voltage if V1 = 0.243V, V2 = 0.628V, V3 = 2.903V, V4 = 2.357V and V5 = 2.651V ? Assume that the opamp is ideal, and use R1 = 6.0kΩ, R2 = 3.5kΩ, R3 = 9.7kΩ, R4 = 1.1kΩ, R5 = 5.5kΩ, R6 = 1.5kΩ, RF1 = 6.2kΩ and RF2 = 1.5kΩ.

Answer: -0.718 ✔

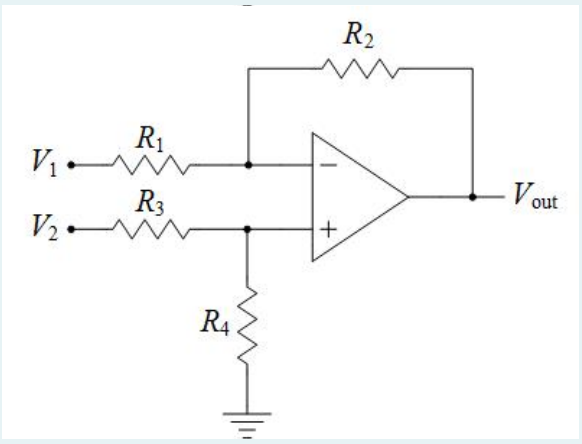
Correct

Marks for this submission: 6.00/6.00.

Question **28**

Correct

Mark 6.00 out of 6.00



What is the differential-mode voltage gain, Adm, in V/V from the differential input voltage, Vidm = V2-V1, to the output for the operational amplifier circuit shown? Assume that the opamp is ideal, and use R1 = R3 = 2.5kΩ and R2 = R4 = 8.3kΩ.

Answer: 3.32 ✔

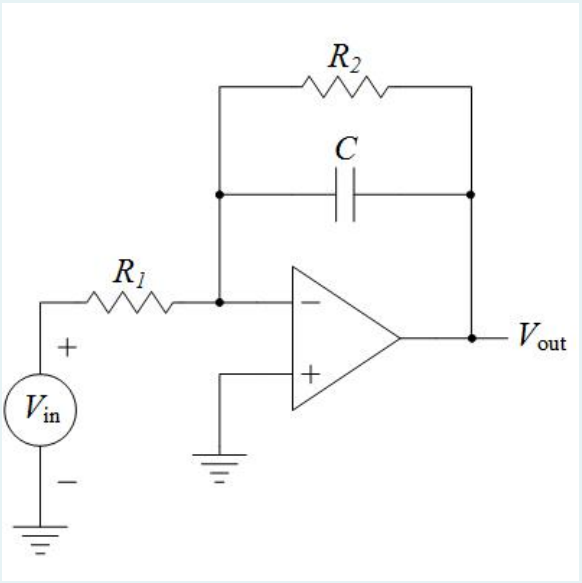
Correct

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 1.4MHz? Assume that the opamp is ideal, and use R1 = 1.6kΩ, R2 = 41.4kΩ and C = 1.0pF.

Answer: 27.72 ✔

Correct

Marks for this submission: 6.00/6.00.

Question **30**

Correct

Mark 6.00 out of 6.00

If an amplifier has a midband voltage gain of 39311 V/V with a single-pole rolloff at high frequencies that starts at an upper -3dB frequency of 79.2 kHz, then what is the amplifier's voltage gain in V/V at 2.7 MHz?

Answer: 1152.63 ✔

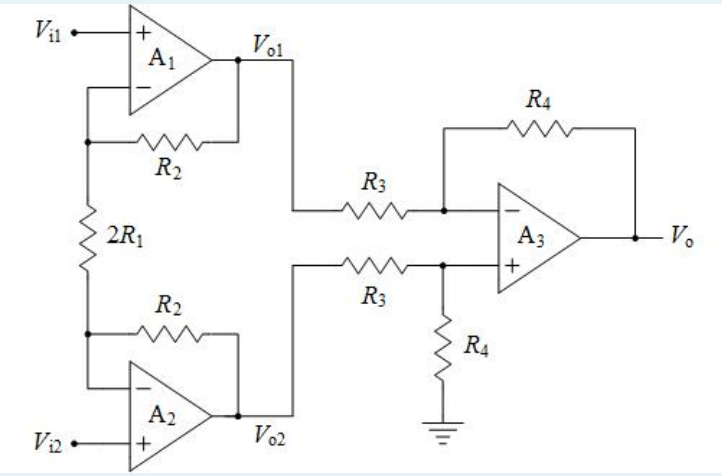
Correct

Marks for this submission: 6.00/6.00.

Question **31**

Not answered

Mark 0.00 out of 6.00



For the operational amplifier circuit shown, what is the output voltage if Vi1 = 0.064V and Vi2 = 0.026V ? Assume that all the opamps are ideal, and use R1 = 9.1kΩ, R2 = 71.5kΩ, R3 = 4.0kΩ and R4 = 52.7kΩ.

Answer:

◄ Quiz 8 - BJT and MOS amplifiers

Jump to...

Midterm Exam II ►