Started on	Thursday, 14 December 2017, 12:05 AM
State	Finished
Completed on	Thursday, 14 December 2017, 12:17 AM
Time taken	11 mins 37 secs
Grade	**6.00** out of 106.00 (**6**%)

Question 1

Not answered

Mark 0.00 out of 2.00

Which of the following is true for a PNP BJT operating in the forward-active region ?

Select one:

- a. The collector current consists primarily of holes injected from the collector into the base
- b. The emitter current consists primarily of electrons injected from the base into the emitter
- c. The base current consists primarily of electrons injected from the base into the emitter
- d. None of these
- e. Some base current flows to replace holes which are lost as electrons diffusing across the base recombine

The correct answer is: The base current consists primarily of electrons injected from the base into the emitter

Question 2

Not answered

Mark 0.00 out of 2.00

Which of the following is true for a PNP BJT ?

Select one:

- a. All of these
- b. The base current consists of mostly holes
- c. A P-type base is sandwiched between an N-type emitter and an N-type collector
- d. Current flows primarily because of electrons injected into the base
- e. Current flows when either Vbe or Vbc are negative voltages

The correct answer is: Current flows when either Vbe or Vbc are negative voltages

Question 3

Not answered

Mark 0.00 out of 2.00

An PNP BJT operating in the reverse-active region has :

Select one:

- a. Vbe > 0 and Vbc > 0
- b. Vbe < 0 and Vbc < 0
- c. Vbe < 0 and Vbc > 0
- d. None of these
- e. Vbe > 0 and Vbc < 0

The correct answer is: Vbe > 0 and Vbc < 0

Question 4

Not answered

Mark 0.00 out of 2.00

For a BJT operating in saturation, which of the following is true?

Select one:

- a. The output resistance, ro , is much smaller than in the forward-active region
- b. The base-collector junction can be forward biased by about 400mV before the collector current starts to decrease
- c. The common-emitter current gain, β , is much smaller than in the forward-active region
- d. The collector current stays nearly constant as the base current is increased
- e. All of these

The correct answer is: All of these

Question 5

Not answered

Mark 0.00 out of 2.00

As |Vce| increases for a BJT in the forward active region, “base-width modulation” causes :

Select one:

- a. None of these
- b. The width of the base to increase
- c. The output resistance, ro , to decrease
- d. The width of the base-collector depletion region to decrease
- e. The collector current for the BJT to decrease

The correct answer is: The output resistance, ro , to decrease

Question 6

Not answered

Mark 0.00 out of 2.00

As |Vce| increases for a BJT in the forward active region, “base-width modulation” causes :

Select one:

- a. All of these
- b. The width of the base-collector depletion region to increase
- c. The output resistance, ro , to decrease
- d. The collector current for the BJT to increase
- e. The width of the base to decrease

The correct answer is: All of these

Question 7

Not answered

Mark 0.00 out of 2.00

For a BJT common-emitter amplifier, which of the following is true ?

Select one:

- a. The input resistance is typically low
- b. The output resistance is typically low
- c. The voltage gain is negative
- d. All of these
- e. The voltage gain is typically low

The correct answer is: The voltage gain is negative

Question 8

Not answered

Mark 0.00 out of 2.00

Considering the typical input and output resistances, which of the following BJT amplifier types is well suited to be used as a transresistance amplifier ?

Select one:

- a. Common-collector
- b. Common-emitter
- c. Common-base
- d. Emitter-follower
- e. None of these

The correct answer is: None of these

Question 9

Not answered

Mark 0.00 out of 2.00

For a MOS common-drain amplifier, which of the following is true ?

Select one:

- a. The gate is used by both the input and output ports
- b. None of these
- c. The output signal is measured at the drain
- d. The input signal is applied to the source
- e. Different circuit topologies are used for NMOS than for PMOS FETs

The correct answer is: None of these

Question 10

Not answered

Mark 0.00 out of 2.00

For a MOS source-follower amplifier, which of the following is true ?

Select one:

- a. The output resistance is typically high
- b. None of these
- c. The voltage gain is positive
- d. The voltage gain is typically high
- e. The input resistance is typically low

The correct answer is: The voltage gain is positive

Question 11

Not answered

Mark 0.00 out of 2.00

On the circuit symbol used for a BJT, the arrow on the emitter always points from the N-side of the junction to the P-side.

Select one:

- True
- False

The correct answer is 'False'.

Question 12

Not answered

Mark 0.00 out of 2.00

If two bipolar transistors have the same bias voltages, then the BJT with the larger emitter area will have a smaller collector current.

Select one:

- True
- False

The correct answer is 'False'.

Question 13

Not answered

Mark 0.00 out of 2.00

A PNP BJT with Vbe > 0 and Vbc > 0 is operating in cutoff.

Select one:

- True
- False

The correct answer is 'True'.

Question 14

Not answered

Mark 0.00 out of 2.00

The currents which flow in a BJT are controlled by the bias voltages applied across the PN junctions.

Select one:

- True
- False

The correct answer is 'True'.

Question 15

Not answered

Mark 0.00 out of 2.00

Transresistance amplifiers need to have low input resistance and low output resistance.

Select one:

- True
- False

The correct answer is 'True'.

Question 16

Not answered

Mark 0.00 out of 2.00

When finding the resistance “looking into” a node, all independent voltage sources should be replaced with open circuits.

Select one:

- True
- False

The correct answer is 'False'.

Question 17

Not answered

Mark 0.00 out of 2.00

The maximum possible gain for a common-emitter BJT amplifier is 1.

Select one:

- True
- False

The correct answer is 'False'.

Question 18

Not answered

Mark 0.00 out of 2.00

The gain of a common-emitter BJT amplifier can be estimated by the ratio of the bias voltage across the collector resistor to the bias voltage across the emitter resistor.

Select one:

- True
- False

The correct answer is 'True'.

Question 19

Not answered

Mark 0.00 out of 2.00

The resistance looking into the source of a MOSFET is typically high.

Select one:

- True
- False

The correct answer is 'False'.

Question 20

Not answered

Mark 0.00 out of 2.00

For a common-source MOS amplifier, the input is applied to the gate and the output is measured at the source.

Select one:

- True
- False

The correct answer is 'False'.

Question 21

Not answered

Mark 0.00 out of 6.00

What is the transconductance, gm, in mA/V for an PNP BJT operating in the forward-active region at 27° C with Ic = 632μA? Use Vt = kT/q = 26mV.

Answer:

The correct answer is: 24.31

Question 22

Not answered

Mark 0.00 out of 6.00

What is the device transconductance, gm, in mA/V for a PMOS FET operating in saturation with Id = 423μA and Von = |Vgs-Vt| = 115mV ? Neglect the effects of channel-length modulation and body effect.

Answer:

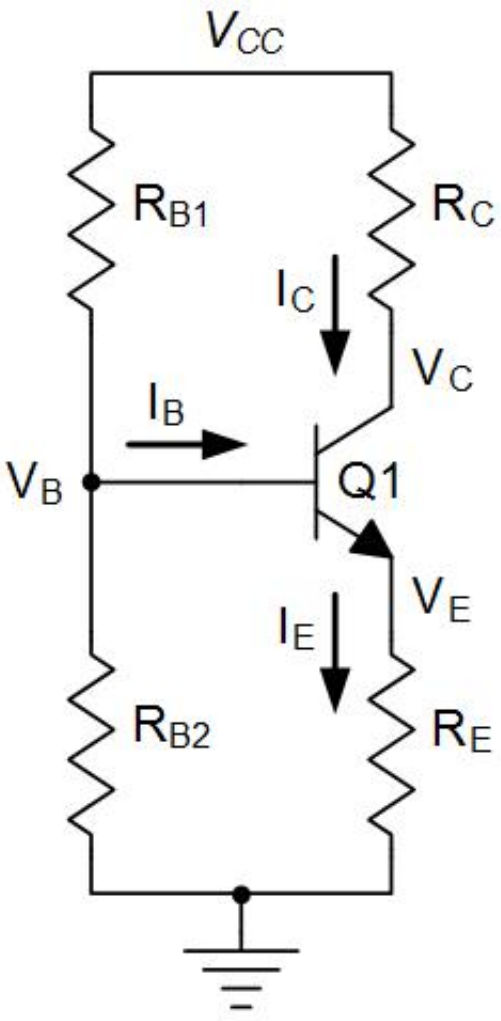
The correct answer is: 7.36

Question 23

Incorrect

Mark 0.00 out of 6.00

For the BJT bias circuit shown, what is the emitter current, Ie, in milliamps? Use Vcc = 11V, Rb1 = 37.5kΩ, Rb2 = 27.2kΩ, Rc = 4.2kΩ, and Re = 2.4kΩ. Assume that the transistor is in the forward-active region, with β = 73 and |Vbe(on)| = 0.7V. Neglect the effects of base-width modulation.



Answer: -1.33

The correct answer is: 1.50

Incorrect

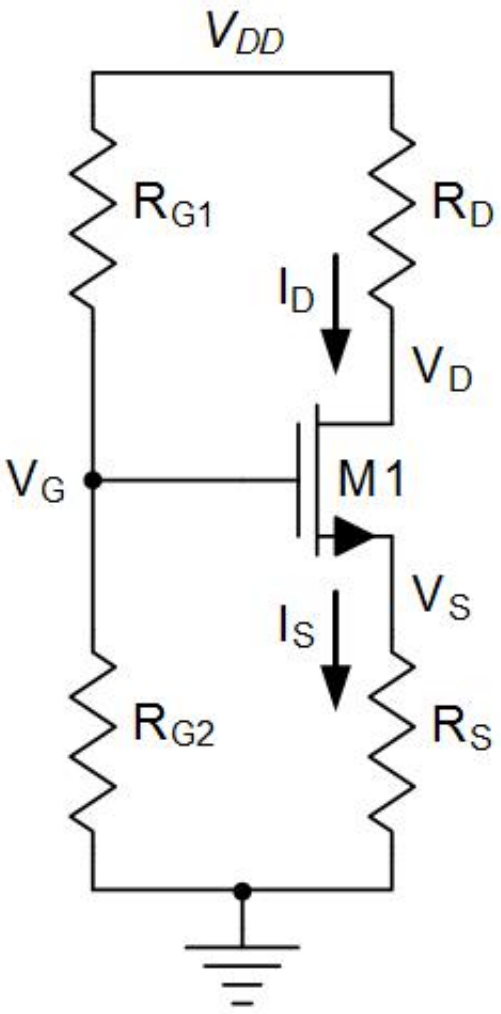
Marks for this submission: 0.00/6.00.

Question 24

Not answered

Mark 0.00 out of 6.00

For the MOSFET bias circuit shown, what value of Rd in kilohms is needed to allow the maximum possible peak-to-peak signal swing on the drain without clipping? Use: Vdd = 13V, Rg1 = 43.9kΩ, Rg2 = 43.5kΩ, Rs = 9.6kΩ, Vt = 0.6V, and Von = 0.43. (Remember that Von = Vov = Vgs-Vt) Neglect the effect of channel-length modulation and body effect. (Hint: Be sure to keep the MOSFET in saturation!)



Answer:

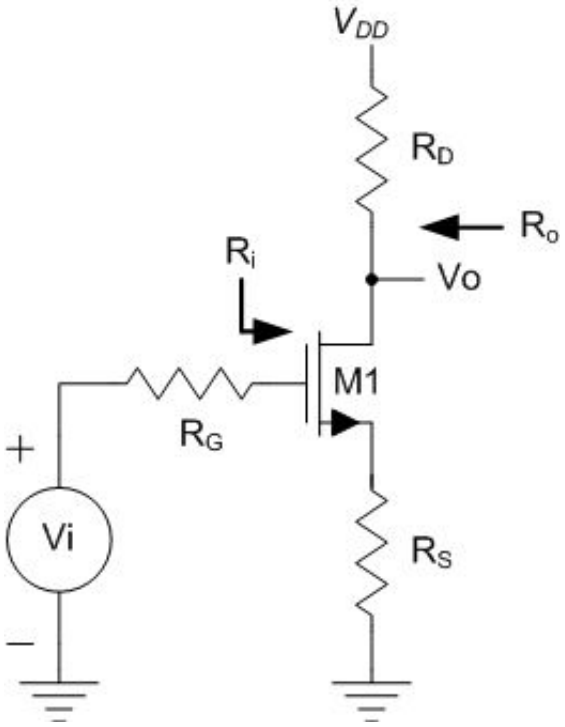
The correct answer is: 6.29

Question 25

Not answered

Mark 0.00 out of 6.00

What is the low frequency voltage gain for the amplifier shown at 27° C with Rd = 22.8kΩ, Rs = 8.6kΩ and Rg = 8.1kΩ ? Use: W/L = 64, Id = 920μA, VTN = 0.5V, k'n = 100μA/V^2. Neglect the effect of channel-length modulation and body effect.



Answer:

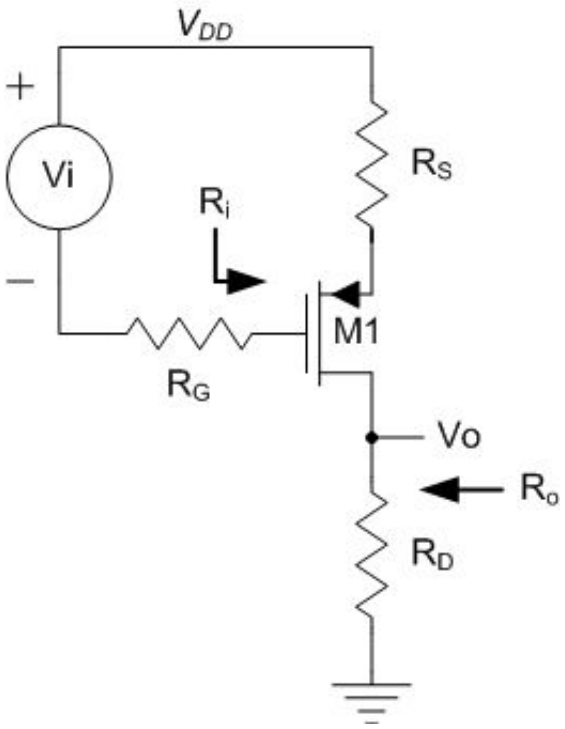
The correct answer is: -2.56

Question 26

Correct

Mark 6.00 out of 6.00

What is the low frequency voltage gain for the amplifier shown at 27° C with Rd = 15.5kΩ, Rs = 0.5kΩ and Rg = 5.4kΩ ? Use: W/L = 59, Id = 936μA, VTP = -0.5V, k'p = 40μA/V^2. Neglect the effect of channel-length modulation and body effect.



Answer: -15.88

The correct answer is: -15.88

Correct

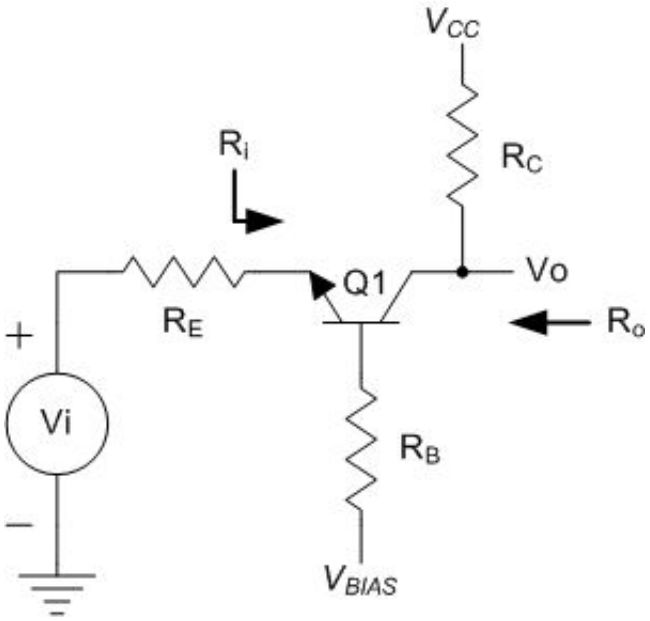
Marks for this submission: 6.00/6.00.

Question 27

Not answered

Mark 0.00 out of 6.00

What is the low frequency input resistance, Ri, in Ω for the amplifier shown at 27° C with Rc = 38.7kΩ, Re = 0.2kΩ and Rb = 0.7kΩ ? Use: Ic = 874μA, β = 124, and Vt = kT/q = 26mV. Neglect the effect of base-width modulation.



Answer:

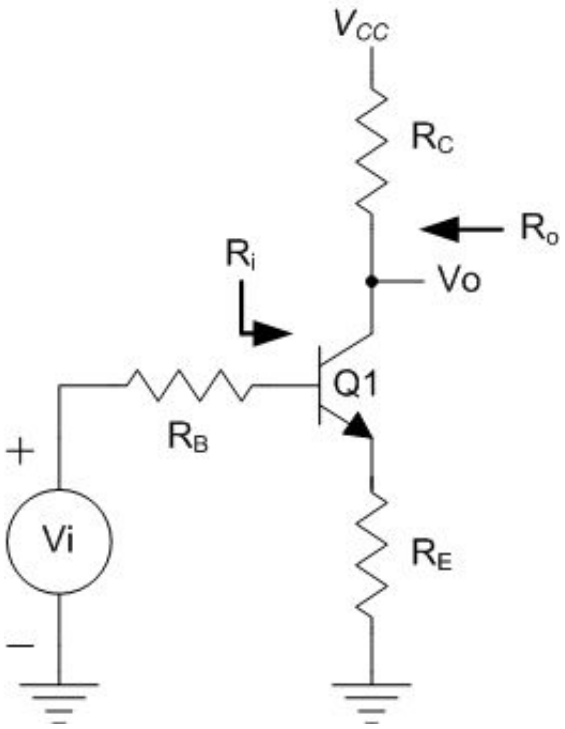
The correct answer is: 35.1

Question 28

Not answered

Mark 0.00 out of 6.00

What is the low frequency input resistance, Ri, in kΩ for the amplifier shown at 27° C with Rc = 31.4kΩ, Re = 0.7kΩ and Rb = 0.7kΩ ? Use: Ic = 652μA, β = 164, and Vt = kT/q = 26mV. Neglect the effect of base-width modulation.



Answer:

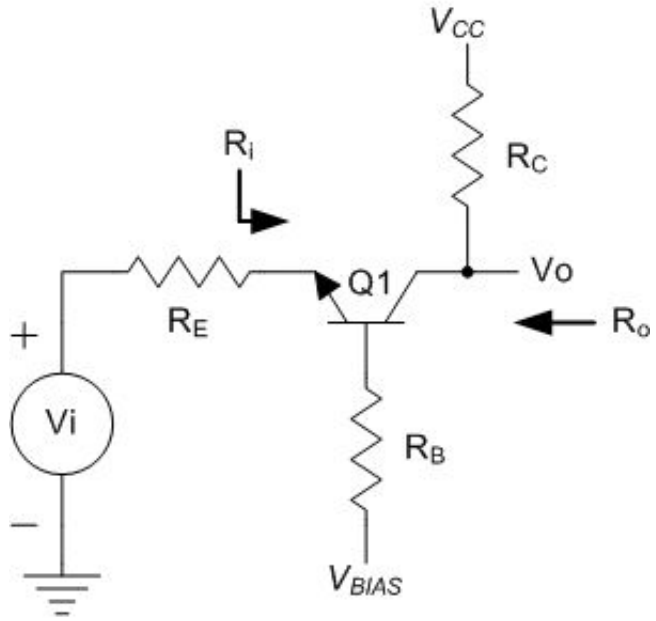
The correct answer is: 122.0

Question 29

Not answered

Mark 0.00 out of 6.00

What is the low frequency output resistance, Ro, in kΩ for the amplifier shown at 27° C with Rc = 96.5kΩ, Re = 0.4kΩ and Rb = 0.2kΩ ? Use: Ic = 870μA, β = 51, VA = 50V, and Vt = kT/q = 26mV. Use the "short-cut approach" discussed in class.



Answer:

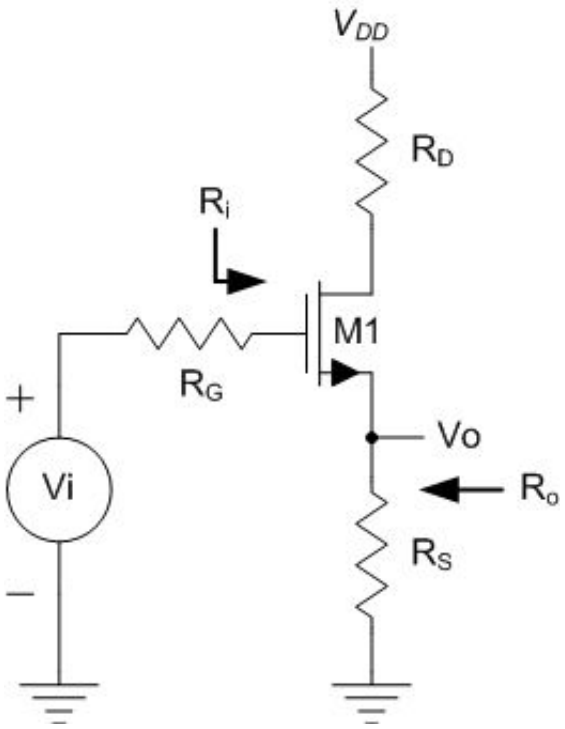
The correct answer is: 86.4

Question 30

Incorrect

Mark 0.00 out of 6.00

What is the low frequency output resistance, Ro, in Ω for the amplifier shown at 27° C with Rd = 21.6kΩ, Rs = 1.0kΩ and Rg = 7.5kΩ. Use: W/L = 95, Id = 990μA, VTN = 0.5V, k'n = 100μA/V^2, λ = 0 Neglect body effect.



Answer: 1 ✗

The correct answer is: 187.4

Incorrect

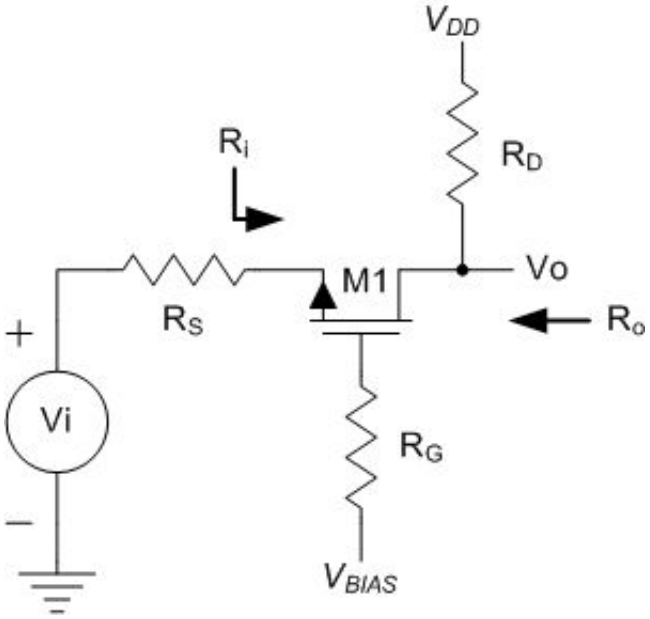
Marks for this submission: 0.00/6.00.

Question 31

Incorrect

Mark 0.00 out of 6.00

Estimate the maximum low frequency voltage gain for the amplifier shown at 27° C with Rd = 35.1kΩ, Rs = 0.2kΩ and Rg = 1.4kΩ.



Answer: 1

The correct answer is: 175.50

Incorrect

Marks for this submission: 0.00/6.00.